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THE FAMILY AND THE NATION

THE
Family and the Nation

A Study in Natural Inheritance
and Social Responsibility

BY

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PREFACE

To the writers of this book the train of ideas outlined therein has given unity to a host of previously unconnected observations. Personal, social, historical episodes have fallen into place, and one great force, ebbing and flowing throughout the ages, is seen moulding the fate of nations.

In the hope that the idea of this underlying unity, which has been so helpful to the writers, may prove useful to others, this book has been written.

To emphasize the importance of inheritance in determining the character and value of each individual, some account is given of recent scientific investigation ; while the pages of history, the composition of contemporary society, and the returns of the Registrar-General have been drawn upon to trace the effects of heredity on the social organism.

CAMBRIDGE, *September 1909.*

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CHAPTER I

INTRODUCTION

MAN's body and mind are framed and moulded by two influences—heredity and environment. Through his parents he inherits certain physical and mental powers which are developed or stunted by the circumstances of his life, by the education given to him by others or won by himself, and by the discipline which his own will, aided or unaided, enables him to extract from the changes and chances of this mortal life.

Great is the power of environment. “There, but for the Grace of God, goes John Bradford,” is a thought that has occurred to us all when watching misfortunes we have escaped. The efforts of men of science, philanthropists, and statesmen have been directed for centuries towards improving the general environment of the race, and of late years with conspicuous success. Two centuries ago the annual death-rate of London was some eighty in a thousand ; to-day it has sunk to fifteen. And a lowered death-rate means more than lives prolonged. It means improved conditions, which give greater health and strength to those who, even in old circumstances, would have survived.

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But, in our wise and beneficent search for better conditions of life, we must not forget the other influence which, even more than environment, goes to make personality. To improve the conditions in which life is passed, and by which it is moulded, is but part, probably by far the smaller part, of the problem. The deeper question, the conscious solution of which is opening out to all civilized nations, is how to maintain, and if possible to improve, the innate quality and character of the life itself.

The power of heredity is an old story. "Family likeness," "family characteristics," "family temper" are expressions which convey ideas well known to all men. Yet with amazing inconsistency we have taken little if any account of such knowledge in our conduct, little if any in our theories of social and political life. We have talked and acted as though it were of no account how men were bred, or what classes of the community were reproducing themselves fastest and what declining in number, as long as each individual was enabled by improved conditions to pass his brief lifetime in increased comfort and security.

The average quality of a race is but the average quality of the individuals composing it. By changes in environment, by modification of economic factors, we may alter the average qualities of the people, not only indirectly by improving the conditions of life, but directly also, by varying the rate at which different classes or sections of our folk bring children into the world. It becomes more and more clear that the groups and associations formed by men are not artificial, not mere matters of chance, but correspond to real

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differences of innate qualities, of mental and physical characters. Already, to some extent, the qualities embedded in the different classes are beginning to be understood, and can be subjected to statistical analysis. Already we see that, by legislation or by the pressure of enlightened public opinion, it may become possible here and there to direct or restrain the growth of population, and thus modify the future history of the race. If, by increased medical and hygienic knowledge, the feeble-minded and weak-bodied stocks be allowed to survive, and if, as seems to be the case at present, they reproduce themselves faster than do the better stocks, the relative numbers of such persons in the country must increase, and the average quality of the race deteriorate. If, by economic and social conditions, children be made too heavy a burden on the more desirable elements of the population, there is danger that the thrifty and far-seeing members of the community will postpone marriage, and, when married, restrict the number of their offspring. Thus, while the weak and careless elements grow at an increasing rate, the good stocks of the people check their rate of growth or even diminish in number, and the selective deterioration of the race is hastened in two ways.

How far are such tendencies apparent or immanent? How can we guard against them or minimize their effects? How can we maintain or improve the innate qualities of our race without trenching on moral freedom and personal responsibility, on ethical standards and religious convictions?

It has been thought by some men that our growing

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knowledge of the power of heredity might weaken or destroy the sense of moral responsibility and personal freedom on which so much of our religious and ethical standards of conduct depends. Such a view, we profoundly believe, rests on a misconception of the basis of that sense of freedom and responsibility with which we are endowed. To this point we shall return ; but it may be well at once to remind the reader that effective freedom is increased and not diminished by a knowledge of the natural laws in accordance with which, whether we like it or not, life is organized. Civilized man, who understands the limitations of mechanical powers, is in effect much freer than is the savage, to whose credulous mind nothing is impossible. Moreover, personal freedom, unchecked by a strong ethical sense or religious conviction, may too readily degenerate into licence, and lose what should be its accompanying feeling of personal responsibility.

Although as yet in the problems of heredity we see but as in a glass darkly, nothing is gained by shutting our eyes. The proper study of man is mankind, and sooner or later the questions at issue must be faced. There is light enough to show that the problems disclosed are of vital importance. The scientific investigation of inheritance is now beginning to lead to definite knowledge—still fragmentary, it is true, but enough to point the way for future inquiry, and here and there to give certain principles which should be borne in mind when we are considering proposals for legislative or social action.

Till recently, the effect of individual conduct or of social legislation on the innate qualities of the people

has been ignored, perhaps not even suspected. Yet the results of selective breeding on domestic plants and animals have been well known for a century or more. The marvellous success which has attended the efforts of breeders in obtaining strains of horses, cattle, and other animals fitted for special uses is only equalled by the results of the work of horticulturists in raising new varieties of fruit and flowers.

Before man's place in nature was understood and acknowledged, the idea that similar though unconscious selection was at work on himself seems but dimly to have crossed his mind. When Lyell and Darwin had placed man in his proper position in the sequence of biological forms, it was seen that principles found to hold generally in the animal and vegetable kingdoms were likely to be worth looking for in the case of the human race. The struggle for life, incessantly at work in the lower world, affects man also. It will tend to modify the character of a nation as it modifies the flora and fauna of a country. Then, as artificial means will change a homogeneous breed of wild animals into the several specialized forms of our domestic flocks and herds, so we must look for a modification of our folk for good or evil by the artificial conditions of modern civilization. There is no finality ; a nation must either be losing or gaining ground, either improving or degenerating. Hence the scientific study of the effect of the existing conditions of any time on the rates of reproduction of different stocks of the nation should be the chief work of the sociologist, and the control of those conditions the supreme duty of the statesman.

At present the study of environment holds the field.

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The results of improvement are there more visible and more immediate. They are of incalculable value, and to them the progress of the past century is largely due. But the changes in the innate qualities of the race, though slower in action, are of even more profound importance than alterations of the external conditions of human existence. Man does not live by bread alone. His inborn qualities of body, mind, and soul are of more worth than physical comfort and convenience. Those qualities depend on heredity, and the form they take in any nation can be modified only by the slow process of selective parenthood. But, "though the mills of God grind slowly, yet they grind exceeding small," and a wrongly directed selection destroys a race more utterly and irrevocably than any failure to take advantage of improved physical conditions of life.

A knowledge of the importance of heredity, instead of weakening the sense of responsibility, shows how much wider and deeper our responsibility is than had been suspected. We come to understand that on our personal and collective action depend not only the present environment of the people, but also the innate qualities of future generations. Blind acquiescence in evil, ignorance of the issues at stake, may result in irremediable injury to unborn millions. Not only are we our brother's keeper, but the guardian of the physical, mental, and moral character of his remotest descendants.

These ideas, once grasped, change profoundly the outlook on sociological and political problems. If once we come to look on all questions of investigation, legislation, and administration from this point of view,

we shall find, whatever may have been our previous political or social creed, our preconceived ideas suffering startling changes. The first care must always be to ask with regard to each proposal, "Will it tend to favour the growth of those elements of the population which already are known to be of national worth?" "Will it tend to check the reproduction of those whom the present fragmentary knowledge already points out as detrimental to the community?" "Will it help to increase our knowledge of mankind, so that we shall be able more certainly to separate the sheep from the goats, and to discover what elements among the people are best and most worthy of encouragement?"

For at every stage of our inquiry the cry for more knowledge becomes insistent. We are still in comparative darkness, and must walk warily in consequence. Direct action at present can be applied safely only at points clear even in the twilight. Our greatest need is for more light.

In all stages of natural development, living beings are subject to a competitive struggle in which the fitter for that struggle gain an advantage. The race is to the swift and the battle to the strong and skilful.

Whether or no this fight for life has led to the production and separation of distinct species in the exact manner suggested by Darwin, without doubt it has modified and is modifying the character of existing types. But the essence of natural selection consists in the conjunction of success in the struggle for life and its fruits with a preponderating rate of reproduction.

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Unless the fittest to survive hand on their qualities to a larger number of descendants than are left by the failures, natural selection cannot act. It is of no use for an organism individually to survive unless it transmits the character which enabled it to do so to a preponderating number in succeeding generations. Until recent years, success in life's race among men has in general meant an increased number of offspring and a better chance for their survival. But now the growing restriction of the birth-rate in the successful classes in all ranks of society has separated the two essential concomitants of progress, and even of stability. A struggle for life and the survival of the fittest are meaningless alone ; the qualities of the fittest must survive superabundantly his own fleeting existence, if the struggle and the survival are to produce any good effect on the race.

In older, more natural, ages, when success in life and a dominant rate of reproduction went hand in hand, two kinds of struggle are to be distinguished. There is the individual rivalry between man and man for the fruits of the earth and the beauty of woman. There is the combined clash of family with family, tribe with tribe, nation with nation. In both the fittest tend to survive ; but the fittest in the individual fight do not always go to make the more efficient social organism.

To conquer in the duel and in love a man needs courage, strength, skill, virility, and good looks. And it is necessary that the society which surrounds him should regard his success as natural and justifiable. The social conditions must be too simple and too healthy for it to be possible that

. . . a laggard in love and a dastard in war
Was to wed the fair Ellen of young Lochinvar.

It is essential also that a man should have a sense of the justness of his cause. It is essential that society should not refuse him the fruits of his success out of misdirected sympathy with the loser.

But, for one tribe to exist against the pressure of surrounding peoples, a new group of qualities are needed. The power of combination and organization, the social instinct, readiness for self-sacrifice to the common good, love of home, country, and race—in a word, patriotism—all are needed to bring to birth and to develop a nation fit to hold its own in the fiery trial of war, and in the slow, grinding stress of economic competition.

Thus, out of the very agony and weariness of the strife, is born that social and moral sense which gives to man his highest attribute and noblest reason for existence. The individual struggle favours physical vigour and mental ability; but those races of men endowed with fellow-feeling and a spirit of far-seeing self-sacrifice alone are capable of forming a strong and homogeneous people. Both kinds of struggle have played their part in the growth and decay of the races of mankind, and in the rise and fall of successive civilizations. Both have been necessary in the past, while man has been pressing onwards, blind and deaf to the meaning and tendency of the ceaseless strife around him.

There is an obvious though superficial antagonism between some manifestations of the moral qualities when developed and the full action of the purifying pains in

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which they were brought forth. Individual and national destruction and replacement still form a potent factor in the physical and mental evolution of the race. Yet our modern tenderness shrinks more and more from the sight of individual suffering. It urges forward all agencies for the amelioration of the lot of the weak who have failed in the struggle, whether individual or national, and would fain uphold those that in more callous ages would have gone under.

Of late years, the means of keeping alive the falling and fallen have grown with ever-increasing speed. Each advance in medical skill, in knowledge of pathology or hygiene, each new moral effort to cope with external evil, results in prolonged life for the members of weak and unsound stock, and still more significant, a lessened mortality among their children. It is not that the pressure of life gets less, but that the consequences of that pressure are prevented from producing effects that are of selection value.

There is often an inclination to deprecate the struggle for life, an endeavour to minimize its effects, to mourn with the loser rather than to rejoice with the winner. But, against the severity and hardship of the life-struggle, must be set the excitement of the battle, the energy and resource it calls forth, the triumph of success, and, through these inducements to exertion, the perpetual selection and survival of the finer varieties of the race.

It is well to mark that the danger of lessened natural selection is, in our stage of civilization, accompanied by a new-won appreciation of the issues at stake. The social organism has grown conscious of its own existence and of the agencies which are

moulding it for better or for worse. We have become like gods, knowing good and evil. Shall we have the patience and insight to study the problem with a single-minded desire for truth? If we find a solution, shall we have the courage and steadfastness to apply it firmly and temperately to the social organism? It may be that the necessary means will run counter to some forms of prevailing sentimentalism, that by-product of the growth in our moral conscience. But moral conscience itself must not be identified with a half-hysterical haste to stop pain or inconvenience at all costs. A sane moral conscience looks beyond, and determines that the best elements both in man and in mankind shall be free to grow and the worst elements shall be repressed whatever stands in the way.

It is possible that the modern desire to alleviate distress and to prolong life in all circumstances is to be traced, in part at all events, to a decay in the old conception of life as a probationary training ground, and the failure to find any worthy ideal to take its place. To those who have no belief in a future existence, this life too often tends to become a banquet in which some feast and others fight for the crumbs. To such minds, pending the revival of a deeper faith, the thought of the future welfare and improvement of the nation or the race may supply the ideal necessary for a worthy life. Those, on the other hand, who regard each man's frame as the dwelling-place of an immortal soul, will feel more the awful responsibility that it is ours to determine, by our individual and corporate action, whether or no the bodies and minds of succeeding generations shall be fit temples for such sparks of

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the divine, fit habitations in which they can expand and develop till they are worthy of a sublimer sphere. We cannot fix exactly the bodily or mental character of any future individual, but we can (and do whether we will or no) control the average future qualities of the race, both in mind and body. Individually we can deal only with probabilities ; statistically we are responsible for certainties.

Let us pass then to inquire how far selection, natural or artificial, has been the means of developing the race, how far it is still acting and in what directions, what will be the effect of that action, and whether it can be controlled in any way to favour the preponderance of all the best physical, mental, and moral qualities.

For selection to play its part in any community, three conditions are necessary. Firstly, the individuals which compose the race must vary one from the other. Secondly, those variations must tend to be inherited, so that the individuals possessing them tend to transmit them to their offspring. Thirdly, the individuals with certain kinds of variation must reproduce themselves faster than the rest of the community.

Unless individuals vary, selection has nothing to work upon. Unless the variations be such that they are transmitted to descendants, its work produces no effect. Hence our first inquiry is directed to the laws of variation in mankind, in regard both to physical and to mental qualities ; our second to the transmission of variations from parent to offspring—the central problem of heredity.

As we have said, the character of a nation is but the average character of the individuals composing it. If one section of the community reproduce itself faster than others, its essential qualities hasten with ever-increasing speed to permeate the whole. The qualities of that section become the dominating qualities of the race, its peculiarities become the normal characteristics of the nation. Therefore our third condition leads to a study of the relative birth-rate in different classes and among different types of the people.

Finally, we must turn to a consideration of the causes and effects of a selective birth-rate, and inquire how far the present social conditions are favouring or impeding the more rapid reproduction of all good and noble qualities.

CHAPTER II

THE SCIENTIFIC STUDY OF VARIATION AND HEREDITY

BEFORE we pass to the problems of variation and heredity in man, it is necessary to trace the progress of our knowledge of those problems in the lower animals, and in the vegetable kingdom. Here experiment is possible, and consequently more definite results have been reached. With these results in mind, it is easier and more instructive to examine the purely observational information that is available about mankind than it would be without such guides.

In the subject as left by Darwin, the greatest need was further light on the variations and mutations necessary for natural selection to have something to work upon. Two possibilities were recognised. Selection might act on the small variations found among the individuals of a species otherwise homogeneous—on the greater speed of an antelope with legs an inch longer than the average of his kind ; or large, discontinuous variations might arise, and the “sports” or individuals possessing them might make large steps towards forming new species at once, if the variations were favourable to survival.

Although Darwin recognised that “sports” had

been the origin of many new varieties of domestic animals and plants, he favoured the view that to small or continuous variations we must look for the chief cause of evolution. But difficulties in that theory soon appeared. A fully developed organ may prove most useful, when in a rudimentary stage it would have no effect on survival. Unless it arose *per saltum*, natural selection would never cause it to develop. Again, a small variation would be bred out of the race, unless the individuals possessing it became sterile when mated with the older type, or refused so to mate.

Such difficulties, together with a careful study of sudden mutations by de Vries, Bateson, and others, have led to a revision of the purely selectionist view. Many biologists hold nowadays that discontinuous variations, or "sports," have contributed extensively to the separation of species. Such "sports" tend to transmit their properties to their offspring; they certainly arise in some cases; natural selection would undoubtedly act on them in one way or the other as they were useful or deleterious to their possessors; they can hardly help being a true cause of evolution. Whether the small or continuous variations are also effective remains an open question.

Small variations may be divided into two kinds: those which are innate; those which are acquired. Innate variations tend to be inherited according to laws we shall study below. But much discussion has arisen about the possibility of the inheritance of acquired characters.

The inheritance of such characters was generally assumed, until Weismann called attention to the fact

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that no definite and satisfactory evidence was forthcoming to support that assumption.

Moreover, it was pointed out by Weismann that the germ cells of organisms seem to be independent of the rest of the body. They descend from the germ cells of the parents, and are not affected directly by changes going on in the individual to whom they belong. But such a conclusion seems difficult to extend to indirect action, and other biologists hold that indirect action may occur, and the germ cells undergo slight changes in consequence of acquired modifications—enough at any rate to affect the properties of the race when the action is prolonged over many generations. Still, it seems that, if acquired characters are transmitted at all, it can be only to a small fractional extent. They can have much less influence in modifying the race than was heretofore supposed. More could be done in a few generations by selecting and favouring the reproduction of innate qualities, which certainly are transmitted, than could be effected in long ages by trying to modify the stock through the direct action of use and environment—even if these influences produce any effect at all.

Moreover, the large discontinuous variations, which are found in "sports" and tend to be transmitted by heredity, are never acquired characters. No man by taking thought can add a cubit to his stature, though by physical culture he may possibly add a fraction of an inch. Still less can he produce by exercise one of the definite structural changes which occasionally appear as sports. Whatever view about the occasional and partial transmission of acquired characters mayulti-

mately prevail, it seems certain that such transmissions must play a part in evolution small compared with that due to the selection of those innate variations which are readily heritable. Inborn qualities are immeasurably more useful to the race than those induced or developed by environment, though to the individual, who has received his allotted share of qualities, the favourable opportunity for developing them is still of the utmost importance. But the power of handing them on, used or unused by the individual, is the true safeguard of the moral and spiritual grandeur of a nation—

All I could never be
All men ignored in me

This I was worth to God, whose wheel the pitcher shaped.

While Darwin was developing his theory of the method of evolution, Gregor Mendel, Abbot of Brünn, was making experiments on the hereditary transmission of definite qualities in peas, and had invented a means of quantitative research which, rediscovered in later days, has modified our conceptions of inheritance.

It was recognized, as for example by Galton, that two modes of inheritance were known. The offspring might acquire from its two parents a certain quality in blended amount, as Mulattos are intermediate in complexion between their Negro and European forebears ; or, on the other hand, the offspring might resemble one or other parent exclusively, as the children of a man and a woman are either boys or girls but no intermediate variety.

The latter mode of inheritance was found by Mendel

to hold for certain qualities in peas, and to follow definite laws of inheritance. His results have been extended to other species of plants and animals by recent observers.

As an example of Mendelian principles let us take the case of the Andalusian fowl, studied by Bateson and Punnett. Black and splashed white Andalusians each breed true when mated together ; we possess then a definite splashed white breed and a definite black breed. If we cross a white bird with a black, the resulting chicks are all blue. So far the result seems simple, and we are inclined to regard blue in these fowls as an intermediate hybrid colour between black and white. But, if we breed further generations exclusively from these blue birds, we find that they do not breed true to type—no definite blue race can be established. Of a large number of birds with two blue parents, on the average, half will be blue, one quarter will be white, and one quarter black. Now, these white and black birds, though derived from blue ancestors, will once more breed true, just as did the white and black of the first generation. By mating together two white birds, we can re-establish a pure splashed-white strain, which shows no sign of its blue ancestry ; and similarly we can recover a pure black strain, uncontaminated by blue to any number of generations.

If we think what these phenomena must mean in the hereditary process, we are led to conclude that the germ cells of the blue birds are not hybrids like the birds themselves. Half the germ cells of a blue bird must be pure "white" in character, half pure "black." Then, when two blue birds pair, it is an even chance

whether two unlike cells meet and develop into a blue chick, or two like cells join to form either a pure black or a pure white bird. We may perhaps regard the mixture of strains, which we find in the germ cells of the hybrid blue fowl, as analogous to the mixture of black and white threads which make up certain grey cloths. To the eye the cloth looks grey, but in reality there has been no true mingling. The threads may be picked out again into a heap of white ones and a heap of black. In the Andalusian fowl, black and white are definite Mendelian properties, which are segregated from each other in the germ cells and never mix. Not all properties show these phenomena. In some cases the hybridization seems to extend to the germ cells themselves, and Mendel's principles do not apply. But the possibility of such simple relations should never be lost sight of, when examining data of inheritance. Moreover, some cases of mixed heredity may be explained by the simultaneous action of several pairs of qualities, each alone definitely Mendelian, which, acting together, are difficult to disentangle.

The Andalusian fowl illustrates the simplest form of Mendelian principles. In other cases the hybrid, which corresponds with the blue bird in the fowls, resembles outwardly one or other of the parents, and only betrays its hybrid nature in the appearance of its descendants.

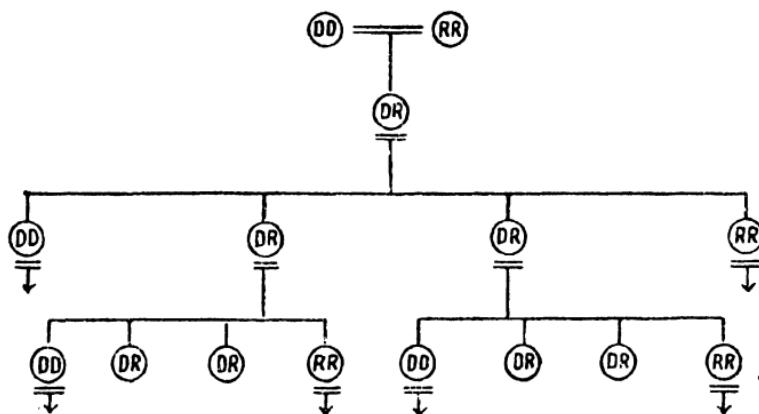
For instance, among the characters of green peas studied by Mendel himself was the height of the plant. Crossing a tall with a dwarf pea, he found that all the resulting seeds gave rise to tall hybrid plants. In these hybrids the tall character is said to be dominant, and the dwarf character recessive. But the hybrid tall

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plants when self-fertilized do not breed true. Out of about a thousand plants of the third generation, almost exactly three-quarters were tall, but one quarter were short. Next year the seeds of this generation were sown, and it was found that the dwarf type bred true and remained fixed in future generations. But the plants of the tall kind differed among themselves. One-third yielded only tall offspring, while two-thirds gave plants divided into "talls" and dwarfs in the old ratio of three to one. The one-third are pure dominants, breeding true to any number of generations, while the two-thirds are impure, giving seeds divided in the same ratio as those of the first generation of hybrids.

Representing the germ cells in each case as of two varieties, we may write as DD the pure-bred original tall parent, in which both varieties of cell carried the dominant character. Similarly, RR will suggest the germinal nature of the original pure-bred dwarf parent in which both factors are recessive. The fertilization of one of these parents by the other can be represented as $DD=RR$. Since each hybrid so formed must derive one factor from each parent, each hybrid must have the composition DR, and contain both kinds of germ cells. But, since one of them carries the dominant factor, it alone will control the outer appearance of the plant, which is externally indistinguishable from the original pure-bred dominant DD. The hybrids, when self-fertilized, can give DD, DR, RD, and RR, and each of these arrangements is equally probable. DR and RD are indistinguishable, and together make up half the number of the offspring. These results may be tabulated in a pedigree.

It will be seen that the recessive character—the character which is concealed in the first hybrid generation—breeds true for any number of generations as soon as it appears at all. On the other hand, individuals which show the dominant character, which marks all the first hybrids, may be either pure or mixed—some of them, except in the first generation, will breed true, but



the majority will have mixed descendants. These phenomena are of great importance to the cattle-breeder and horticulturist. Careful segregation of the seeds of individual plants may establish a true variety in a few generations, where the old plan of mixing the seeds of all individuals which looked the same could, at best, lead to success only after a long and tedious process of selection.

One of the most interesting questions raised by our Mendelian knowledge is the problem of the transmission of sex. Sex is a sharply segregated quality; an individual is either male or female. The fact that in the higher animals, at any rate, the numbers of the sexes born are very nearly equal suggests that the germ cells of

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one parent are all of the same kind, while those of the other are of two species. There is some evidence to indicate that the germ cells of the female are of two kinds, while those of the male are all similar. If so, a female carries both male and female characters, while a male is exclusively male. The sex of any one offspring is determined solely by the chance whether one of the germ cells of the male meets a male or female germ cell of the female.

So far, we have dealt only with a single pair of contrasted characters—whiteness and blackness, tallness and shortness. When the simultaneous inheritance of two or more pairs of characters is examined, the phenomena naturally become more complicated.

Sometimes the two pairs of characters are transmitted quite independently of each other. Grains of maize may be either yellow or white, either smooth or wrinkled. If a smooth yellow type of maize be crossed with a wrinkled white variety, all the resulting grains are smooth and yellow. Thus smoothness and yellowness are dominant characters, and wrinkledness and whiteness recessive. To investigate the nature of these apparently similar plants, they are crossed with the wrinkled white variety. As these characters are recessive, they only appear when the germ cells of the dominant hybrid possess them also. Hence the result of this experiment gives the nature of all the germ cells of the hybrid. It was found that some eleven thousand grains were divided almost exactly equally between grains which were smooth and yellow, grains smooth and white, grains wrinkled and yellow, and

grains wrinkled and white, each combination appearing in twenty-five per cent of the whole.

It follows that a nearly equal number of the germ cells of the double hybrid first obtained bear each of the four possible combinations of characters. The distribution of one character does not depend on the presence or absence of the other characters. If a germ cell is yellow, it is an even chance whether it is smooth or wrinkled. The inheritance of the two pairs of characters goes on independently.

But this independence is not found universally. In some cases two characters are present together if present at all; they are coupled. In other cases it is found that one character, if present, prevents the acquirement of the other; something in the characters must be inconsistent, so that they cannot exist together, or can so exist only with difficulty.

Again, some characters can only manifest themselves in presence of certain other characters, without the existence of which they remain latent. On these lines, the well-known phenomenon in domestic species of reversion to ancestral wild types has been explained by Bateson, in terms of Mendelian conceptions.

On the other hand, some qualities seem to be incompatible with others, so that if one is present the other is either absent or is converted from a dominant into a recessive character. The possession of horns in sheep is connected with the sex-factor. In the Dorset horned breed both sexes have horns, in the Suffolks neither. If a Dorset be crossed with a Suffolk, the resulting rams are horned and the ewes hornless, while in the next generation all varieties appear. Thus the

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factor for horns is dominant in rams and recessive in ewes ; it has difficulty in manifesting itself in presence of the factor which makes a sheep a female.

The practical application of this new-won knowledge to the arts of the breeder of new varieties of domestic plants and animals has only now begun.

Perhaps the most striking success already obtained is the production of new varieties of wheat by R. H. Biffen. English wheat bears large crops, but is deficient in a certain baking property known as "strength," which yields the kind of puffy white bread now in fashion. Canadian wheats are "strong," but those of them which maintain their "strength" in English soils yield small crops. Biffen found that "strength" and its absence were definite Mendelian properties in wheat, "strength" being the dominant. By crossing a "strong" Canadian wheat with a "weak," high-cropping English variety, he got a first generation of hybrids, all of which were "strong." In the second generation the proportion of "strong" to "weak" was three to one, and of the "strong" some bred true in future generations, and contained also, as a fixed character, the high-cropping qualities of the other original progenitor.

Another pair of qualities in wheat shows Mendelian phenomena : liability to the attacks of the fungoid disease known as rust, and immunity from those attacks. Biffen has used the new methods of experiment to obtain varieties in which immunity to rust is combined with other desirable properties.

The experiments we have described make it clear

that the laws of heredity can, in general, only be applied to foretell the average results in large numbers of cases. We cannot predict whether any one chick with two blue Andalusian parents will be black, white, or blue. All that we know is that, of large numbers of such chicks, half will be blue and one quarter each black and white. In general, heredity cannot deal with individuals, but only with large groups of individuals, statistically and in the aggregate.

Statistical methods indeed were applied to biological problems by Quetelet in 1845, before Darwin published *The Origin of Species*, before Mendel's work was done, and long before its importance was recognized. Quetelet pointed out, in a series of letters to the Grand Duke of Saxe-Coburg and Gotha, that the mathematical theory of chance and probability might be applied to many biometrical problems, and thus throw light on some departments of sociology.

A typical example of the action of chance is the falling of a number of coins with "head" or "tail" upwards when the coins are tossed. If we have two coins, the possibilities are that we may get (1) head, head; (2) head, tail; (3) tail, head; (4) tail, tail. But of these cases (2) and (3) are essentially identical. Each combination is as probable as any of the others, and thus the chances of obtaining two heads, one head and one tail, or two tails, are as 1 : 2 : 1. If we had ten coins, and made 1024 trials, tossing all the coins each time, calculation shows that the probable relative frequency would be in accordance with the following numbers :—

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Heads.	Tails.	Relative Frequency.
10	0	1
9	1	10
8	2	45
7	3	120
6	4	210
5	5	252
4	6	210
3	7	120
2	8	45
1	9	10
0	10	1

If we plot these results on a diagram, measuring the number of tails from left to right horizontally, and the number expressing the relative frequency in each case vertically, we get Fig. 1, where a smooth curve is drawn through the points as plotted.

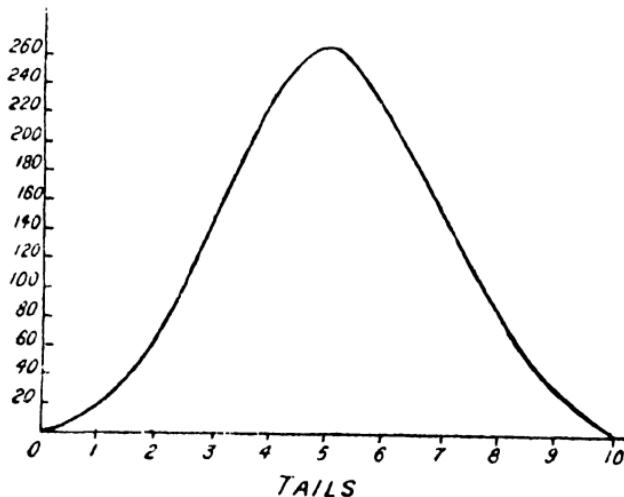


FIG. 1.

This curve gives the theoretical distribution of frequency for ten coins. In any actual series of

experiments, we get results more or less resembling those indicated by theory, and the concordance improves as the number of throws of the coins is increased.

Curves of a similar type are obtained when independent measurements are made of any physical quantity, such as the height of a mountain. The individual measurements are subject to many sources of error. Usually some errors tell one way and some the other, and we get the majority of the results near the average value. But occasionally, all or nearly all the errors chance to fall on the same side, and we get a solitary result differing much from the mean, just as about once in 1000 throws all our ten coins fell head upwards.

While the general type of curve is maintained in all such measurements, its exact shape depends on the accuracy of the observations. In those physical measurements where great exactitude is possible, nearly all the results would closely approach the mean. The curve, therefore, is high in the middle, and falls rapidly on each side. If large errors are unavoidable, the number of observations which differ widely from the mean increases, and the curve flattens and broadens.

Similar phenomena also appear when measurements are made of biological quantities. Fig. 2 shows the variation in measurement of the chests of a large number of Scottish soldiers. It illustrates clearly the concentration in the number of men near the mean value of about 40 inches, and should be compared with the theoretical curve of frequency given in Fig. 1.

Again, Fig. 3 represents the variation in length of the fruits of three varieties of Evening Primrose

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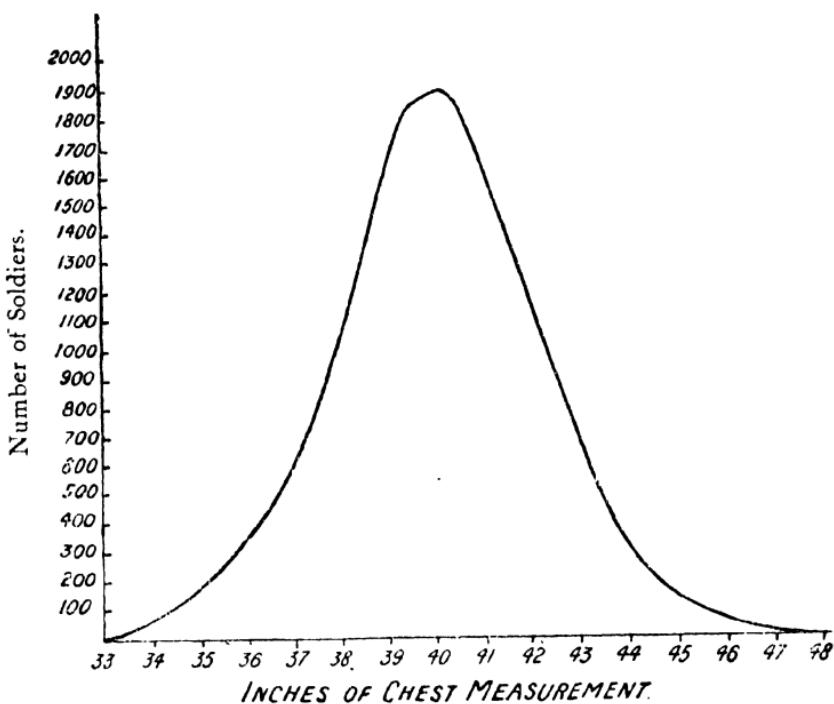


FIG. 2.

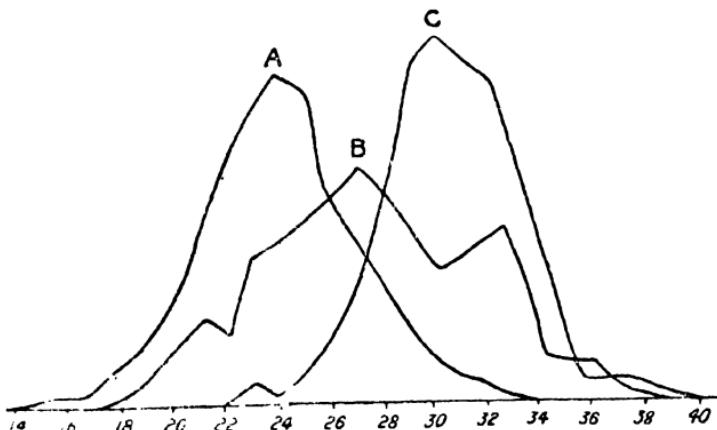


FIG. 3.

measured by de Vries. The lengths are measured horizontally, and the numbers of individuals showing particular lengths of fruit are plotted vertically.

The species A and C have a characteristic mean size of fruit, and their corresponding curves closely resemble the theoretical curve given above. On the other hand, the third species, represented by the curve B, shows sign of subdivision into two separate groups at least. Had the seeds of all three varieties been classed together, the three curves would have coalesced into one, which would have approached in form the normal curve of simple variation.

This result not only shows the agreement with the normal type of curve, given by measurement of the individuals of a homogeneous species such as A or C, but also illustrates one of the dangers which accompany the use of statistical methods in biological problems. It is often impossible to tell from the data whether a single group or a number of groups are involved. Caution is necessary in the application of a method which is liable to such a fundamental uncertainty. But the need for care does not destroy the usefulness of the theory of variation. Where the individuals concerned are known to be of homogeneous type, the normal curve will express the variations from the type, and where many different types are present the normal curve will still be found to represent the result, though for somewhat different reasons.

Where we are dealing with the small, continuous variations, shown by the different individuals of a homogeneous species, the normal curve will express their distribution. Where discontinuous variations or sports

are appearing, our material ceases to be homogeneous, and the normal curve gives no indication of the actual distribution.

Light is thrown on the distinction between the two kinds of variation by the recent work of Johannsen on what he calls "pure lines." The weights of the seeds of a single variety of bean differ from each other. Most seeds have weights near the mean value, but a few diverge more or less from it, in accordance with the usual normal curve. Plants, raised from the heavier seed and self-fertilized, themselves produce seed the average weight of which is in general high, while the light seed produces usually light-seeded offspring.

5, 1 & 1

But, if a single seed be taken and made the starting-point of a family of self-fertilized descendants, no agreement, even of the general kind noted above, is found between the weight of a seed in the family and the seeds of the individuals which grow from it. The variations in weight of the seeds have no hereditary value—they are not transmitted.

Such a family, derived from a single original ancestral seed, is called by Johannsen a "pure line." All individuals within the family have the same ancestry, and are therefore genetically similar. The variations which they show are then accidental, and are not transmitted in heredity. To variations of this type the name "fluctuation" has been given.

It seems, then, that individuals with an identical ancestry of this particular kind form a stable type. The individuals may vary more or less, but they cannot transmit their variations to their offspring. The offspring

revert to the type ; they show variations, but the variations bear no relation to those of their respective parents.

If this result be substantiated, it will follow that variations which are inherited must be derived from ancestral differences. A true division of variations into two classes essentially distinct would thus be made. The real contrast is not between small variations and large. It is probably true that large or discontinuous variations can only be produced by ancestral differences, but small ones may be either of ancestral origin or of the fluctuational type which arises in pure lines. The real distinction is between variations due to ancestral differences, or mutations, and the accidental variations or fluctuations which would appear, even were we dealing with a "pure line." The ancestral variations, modified or unmodified, are transmitted to future generations, the accidental variations are not.

Whether or no these ideas be supported by further research, the study of the transmission of the variations actually found in a more or less homogeneous race is of fundamental importance. If a parent differ from the normal type of the race by a certain amount in a certain direction, will his offspring also differ in that direction, and to what amount?

A long series of statistical investigations by Karl Pearson and others enables us to answer this question with certainty. In a race, whether of men or of animals, mating at random, on the average of large numbers, the offspring will diverge from the mean in the same direction as the diverging parent, and to approximately half the amount. If the average stature of the men of a race be 5 feet 8 inches, a man of 6 feet will exceed

the mean height by 4 inches. If we measured the sons of a large number of 6-feet fathers, we should find that, while some were taller than their fathers and some shorter, their average height was very nearly 5 feet 10 inches, that they exceeded the mean stature by 2 inches, by half as much as their fathers.

This result is expressed by saying that the coefficient of correlation is about one-half, or 0.5. Had the sons been just as tall as their fathers, the coefficient would have been unity, and had the sons' average height reverted to that of the race in general, there would have been no relation between the variation of parent and offspring, and the coefficient would have been zero. In this way we can express conveniently the statistical intensity of inheritance of any character.

Closely similar values for the coefficients of correlation have been obtained by investigating many other common characters in men and in animals and plants. The intensity of inheritance in all cases seems to be represented by a coefficient lying between 0.4 and 0.6.

It follows, then, that the ordinary variations found in the usual races of mixed ancestry, whether of man or other beings, are inherited. They are not wholly mere fluctuations or chance differences of the individual, such as Johannsen found with pure lines of bean plants. They have a definite meaning in heredity, a real selection value.

If, instead of allowing the race to mate at random, we selected both parents for some one quality, we could raise the intensity of inheritance, and establish gradually by continued selection a strain in which the quality reached a value much higher than its average in the

original mixed race. This is one of the methods of the horse-breeder and the horticulturist, and their success is a standing proof of the inheritance of the variations found in a race, originally made more or less homogeneous by random breeding, but derived from a mixed ancestry and containing a large number of germinal differences.

To a certain extent selective mating in mankind does occur even without conscious choice. Families with similar occupations, ideals, and characters tend to associate, and this tendency increases the opportunities for individuals with similar qualities to realize their innate preference for each other. Instances will be given later to show how this process results in the segregation of distinct types of ability in various sections of the community. Were this tendency to selective mating not in action, the coefficients of correlation between one parent and the offspring would be less than they are, though it is difficult to estimate what would be the decrease in their value.

Another method of studying the correlation of characters between parents and their descendants was followed by Galton. He measured the average fractional contribution of each ancestor to the total heritage of the offspring in a mixed race. From an examination of the records relating to the basset hounds of the late Sir John Millais, he found that the contribution of the parents was about one-half, that of the grandparents one-quarter, that of the great-grandparents one-eighth, and so on.

Now, if this law of ancestral inheritance be understood to mean that the character of each individual is a

vague mixture of those of all his ancestors, it is clearly inconsistent with Mendelian principles. According to those principles, a personality is made up by the chance conjunction of different unit factors, derived from certain individuals only among the ancestry. The law of ancestral inheritance, whereby every ancestor contributes his share in proportion to his nearness in descent, is inapplicable.

Much discussion of this point has taken place. It seems possible if, instead of one individual, we consider large numbers, Mendelian principles would lead to results not far different from those suggested by Galton's law. The frequency of Mendelian dominance would produce, on the average of large numbers, greater resemblances of children to their parents than to their grandparents, and to more distant ancestors. Even on Mendelian principles, something like the law of ancestral inheritance may on the average hold good.

CHAPTER III

INHERITANCE AND VARIATION IN MANKIND

THE inheritance by children of some share of their parents' qualities is a matter of common observation. The transmission seems at first sight to be capricious, but the very attention which is drawn to any marked departure from family type shows that the power of heredity is recognised by general consent.

A moment's reflection suggests that the capriciousness is a question of the individual, and that, on taking a large number of cases, we should expect to find definite laws holding good, as we do in other forms of life.

The qualities we desire in plants and animals are comparatively simple; those which give to man his dignity and value are extremely complex. The problem of tracing the descent of hereditary characters in mankind is much more difficult. Nevertheless, that problem was attacked systematically by Sir Francis Galton as early as 1869, and his great works on *Hereditary Genius* and *Natural Inheritance* stand as landmarks in the subject.

Since that date the study of inheritance in plants and animals has been revolutionized by the rediscovery

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of the work of Mendel, and the application of his methods by other naturalists.

It will be well, then, to begin our consideration of inheritance in mankind by tracing the progress which has been made in the discovery of Mendelian factors in the human race. Afterwards we will pass to more general cases, where Mendel's principles either do not hold, or are too difficult to follow through the maze of phenomena for us yet to have established their presence.

Although we take this course, it must not be supposed that the sociological conclusions we draw from our general study of heredity in man depend on the new knowledge associated with the name of Mendel. Mendel's theories give us a working hypothesis which tells us what to look for in examining new data. Hence it is well to put those theories in the forefront. But, however we interpret them, the facts of heredity remain, and must be reckoned with by the sociologist and the statesman.

The success of Mendelian methods depends on our ability to isolate certain characters and treat the inheritance of each character as a separate problem. Now, many of the qualities in mankind which we are accustomed to think of as definite simple characters are in reality extremely complex. It needs the conjunction of many different factors to make an able man, a charming woman, an effective politician, or an accomplished swindler.

We must begin, then, with some simpler and more definite character, in the hope that it will depend on one Mendelian factor alone.

Such a character has been found by Hurst in the brown pigment in front of the iris of the eye. When present in large amount, this pigment gives to the eye the appearance known as brown or black, while, if there be little or no pigment, the eye is described as blue or grey.

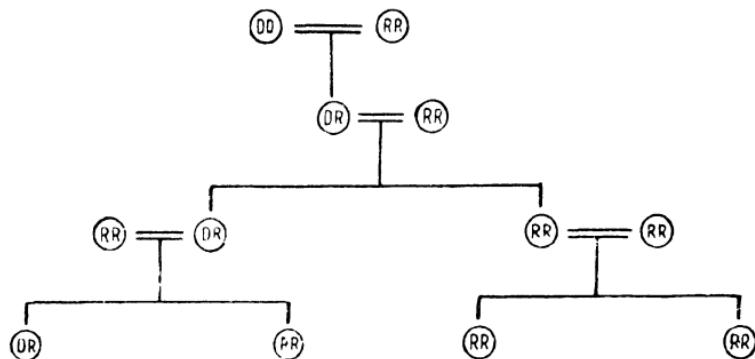
Hurst found that the type of eye possessing the brown pigment was dominant to that without it; that the factor giving brown pigment, if present at all, always showed in the eye. We may say then that brown eyes are dominant and blue eyes recessive; though casual description may lead to error, as it is the presence of the pigment which is the Mendelian factor, while the general appearance of the eye depends on the amount of the pigment.

If we represent the dominant character by D and the recessive by R, the mating of two individuals, one pure-bred with regard to brown eyes and the other pure-bred with regard to grey, may be denoted by $DD = RR$. Since the children must obtain one factor from each parent, they will all be represented by DR, and in appearance all will resemble the dominant parent—that is, all will possess brown pigment in their eyes.

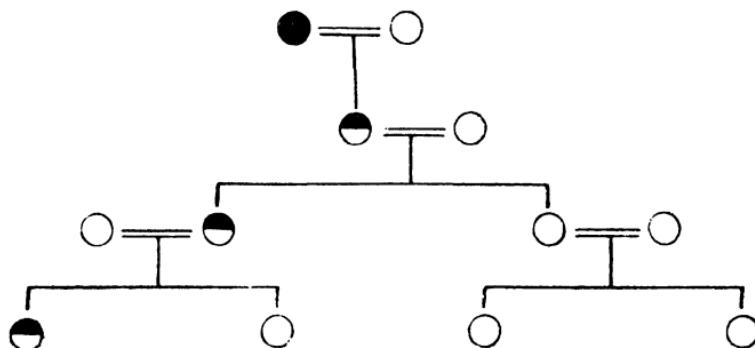
If one of these offspring marry a pure-bred grey-eyed person, an RR, we have the union $DR = RR$. On the average, half the children of such marriages will be DR and half RR. The former class will be brown-eyed, but not pure-bred, while the latter class will be pure recessives who have lost altogether the factor on which brown eyes depend. As long as they mate with grey-eyed people their descendants will never have brown eyes.

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We therefore get the following theoretical pedigree :—



If we wish to trace a dominant character, we may make its descent more visible in the diagram by representing it as ● if pure bred, and as ○ if half-bred. Although these two classes are identical in outward appearance, their innate differences show at once in their offspring. We then get the scheme



Here we have traced the descent of a dominant character in a recessive population : the inheritance of a brown-eyed strain in a grey-eyed people.

Whenever we find a character transmitted in such a

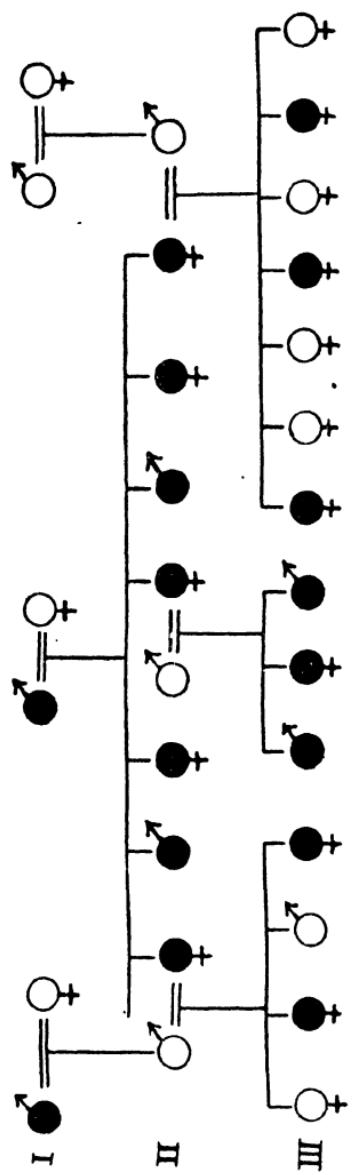
way that some of the children of the marriage of a person showing the character with a person without it manifest the character clearly and some not at all, we may suspect Mendelian dominance. If, in a long pedigree, these two types of children be on the average nearly equal in number, and if the character be transmitted only through those persons who show it openly, our suspicion may become a certainty. A recessive character may appear in the offspring of a person not showing it, but a dominant character, if present at all, must be apparent. If a person have it not, he cannot transmit it.

Let us compare these theoretical results with those actually found by Hurst in the population of a Leicestershire village.¹ Parents with no brown pigment in their eyes produced exclusively children without it. Brown-eyed parents, on the other hand, might be either pure-bred or half-bred with respect to that character, and the relative numbers of their brown-eyed and grey-eyed children were very nearly those of the theoretical Mendelian results.

As we cannot tell by inspection if an individual be pure or half-bred with regard to a dominant character, we will represent all brown-eyed persons by the symbol ●, whether they be of the type DD or DR.

¹ For details of this and other investigations on Mendelian phenomena reference is made to Prof. Bateson's recent book on Mendelism. Other instances of inheritance in this chapter are taken from *The Treasury of Human Inheritance*, edited by Prof. Karl Pearson.

Inheritance of Brown Eyes.



● = an individual with brown pigment in the iris of the eye, whether the iris be self-coloured or ringed.

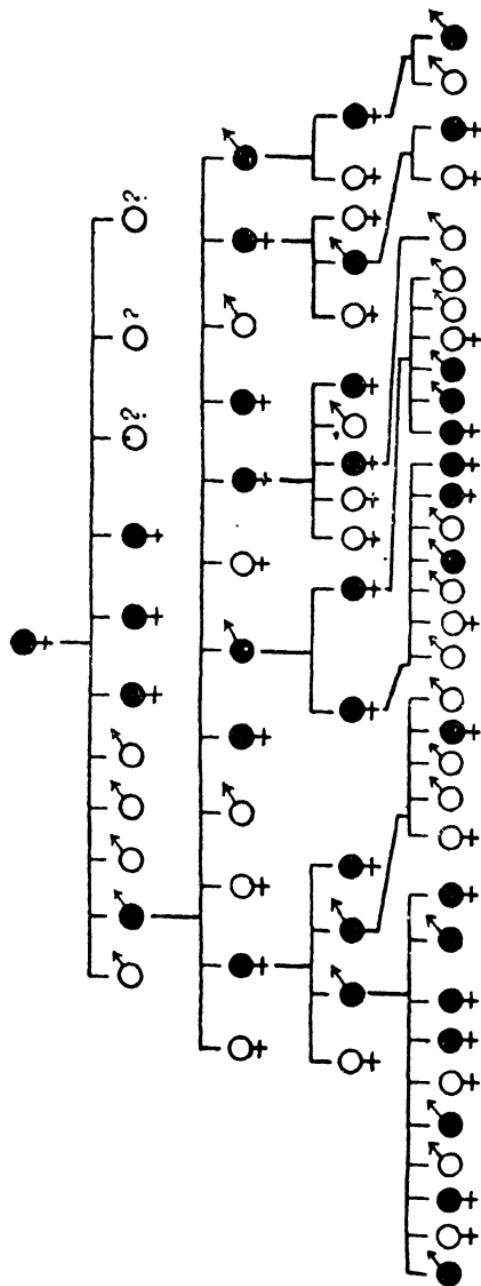
○ = an individual with no brown pigment in the iris.

Here the second pair in generation I. probably consist of a pure-bred dominant brown and a pure-bred recessive grey. Their offspring are all of the type DR, and, when mated with recessives, produce together eight brown-eyed children and six with grey eyes—a good approach to the Mendelian equality. Other similar pedigrees might be given, or may be traced. In all cases care must be taken to consider a sufficient number of individuals before drawing general conclusions about the problems of inheritance.

Many diseases and malformations seem to depend on a definite pathological condition, and to descend as Mendelian dominants. The affection known as brachydactyly, in which the fingers are shortened and possess only one joint instead of two, is a dominant character, the normal condition of the fingers being recessive.

Two pedigrees of brachydactylous families have been described. One, published by Farabee, is illustrated below. In each case the affected parents married normal persons, and, to simplify the diagram, the marriages are not indicated. Moreover, the children of unaffected parents were none of them affected, so, to save space, they, too, are omitted from the figure. As before, the signs to look for are the transmission of the character through those alone who possess it, and the equality in number of the affected and non-affected among the children of affected and normal parents.

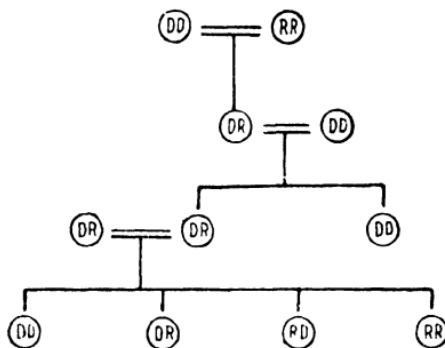
The following table gives the results of Farabee's inquiries :—

Inheritance of Brachydactyly.

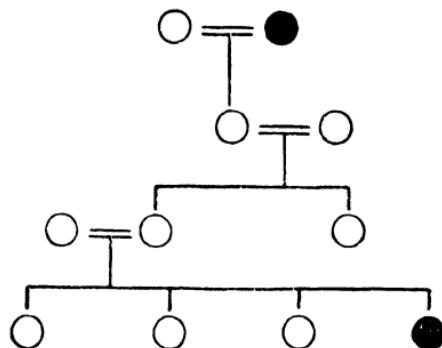
The peculiarity descends only through the affected. No unaffected person had brachydactylous children. The affected parents, all of whose known offspring are entered in the pedigree, married normal unaffected recessive husbands or wives. Their unions are therefore of the type DR=RR, when on Mendelian principles the chances are that half the children will be DR, and therefore will show the peculiarity, since it is a dominant, and half will be RR, pure recessives in whom it has been clean bred out. To bring the figure within compass, the marriages of the unaffected members of the family are not tabulated, but, as mentioned above, in no instance did their descendants prove to be brachydactylous. Of the known children of the affected, it will be seen that thirty-six are brachydactylous and thirty-three are normal—a close approach to the Mendelian probability. Another family investigated by Drinkwater showed similar phenomena, with numbers of thirty-nine to thirty-two affected and unaffected children of DR=RR marriages. There is little doubt that brachydactyly and its absence are in man a pair of simple Mendelian factors, the malformation being a dominant character which appears whether the individual is a pure-bred DD or a cross-bred DR—whether he gets the peculiarity from both parents or from one only.

Some other diseases, such as certain forms of cataract, show signs of similar relations; they appear to be simple Mendelian dominants. No clear case of a pathological condition inherited as a recessive seems yet to have been traced. As such characters would not always be transmitted directly from parent to child, evidence is much

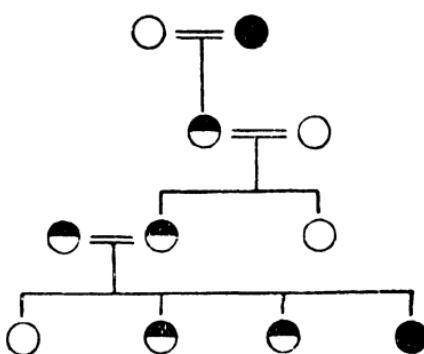
more difficult to collect. The theoretical descent of a recessive character should be in accordance with the scheme,



In the other notation, in which the peculiarity when it exists openly is represented by a dark circle, this becomes



The descent is made clearer if we write the symbol ● for a person who possesses the character not visibly but in some of his germ cells. We then get



—a scheme which shows at once the effect of marriage between two persons, each of whom, though not openly affected, has the peculiarity as a germinal character.

As long as an individual contains only a single dose of the factor, the peculiarity, being recessive, does not become manifest. But, as soon as two persons who possess the concealed character marry, one-quarter of their offspring may be expected to be impregnated with a double dose, and to be pure recessives with the peculiarity apparent. If such persons intermarried, all their offspring would be affected, and a definite breed, showing the peculiarity, might be established.

It is clear that a recessive character is much more difficult to trace through a pedigree than is a dominant character. As a clue for research it may be pointed out that peculiarities which are prevalent among the offspring of consanguineous marriages, especially those between first cousins, are likely to prove recessive factors. If the peculiarity be concealed in the blood of a family, when cousins marry, it is probable that some of their children will get the recessive character

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from both sides, and, being pure-bred with regard to that character, will show it openly.

The more complicated phenomena which have been traced in plants and animals when two characters are coupled, or are incompatible, have also appeared in the study of mankind, and, when more is known, will probably explain cases of inheritance which are now too involved for elucidation.

Night-blindness, an inability to see in a faint light, affects men more often than women. It is transmitted by affected men, but not by unaffected men. It is, however, often transmitted by unaffected women. Apparently normal women, sisters of affected men, may transmit the peculiarity to some of their sons, but only if they marry a night-blind husband can they give it to their daughters.

This sex-limited descent is to be compared with the inheritance of horns in sheep, which we have described above. In sheep, horns are dominant in rams and recessive in ewes. If the rams contain the factor at all they exhibit it; hence they can transmit the character if they themselves show it, but not otherwise. In the ewes, some other factor opposes the development of horns, and horns only appear if the tendency to form them is born in the ewe from both its parents. Some ewes who do not themselves show horns may nevertheless transmit them to their male lambs. Similarly, night-blindness must be regarded as a dominant character in men, but a recessive character in women.

The characters hitherto considered have been definite and simple—a man is or is not brachydactylous or night-

blind. But the majority of the normal characters which make up a man are too complex for statement in these terms. His stature is controlled by the total length of many bones, each of which may be separately variable ; his strength is determined by the co-ordination of many factors, associated with different members of his body ; his ability depends on the proper conjunction of a still larger number of attributes : intellect, application, will-power, sense of duty, each of which itself may be highly complex.

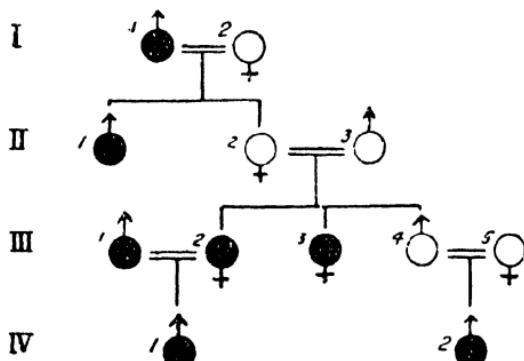
In the present state of our knowledge, it is premature to attempt to trace definite Mendelian inheritance in such complicated characters. Our new familiarity with the rules of simple inheritance, it is true, enables us to catch suggestive glimpses of order from time to time ; but, for the most part, we are driven back at present to vaguer statistical methods. Able parents continue to produce more than their numerical share of able children, whether or no ability ultimately be resolvable into a very large number of dominant Mendelian factors. Occasionally we shall find that some "sport" arises, apparently spontaneously, whether we regard it as indicating some process of conjunction of recessive characters not visible in the parents, or prefer to leave it unexplained.

Even in the inheritance of many diseases we cannot yet prove that exact Mendelian principles hold. Often it is the predisposition to the disease, and not the disease itself, that is inherited ; the disease must then be induced by external conditions. In other cases, the disease may be produced by several causes, only one of which is hereditary. Thus deafness is to some extent hereditary, but doubtless it is also producible by

injury in infancy, by such diseases as scarlet fever, and by other causes.

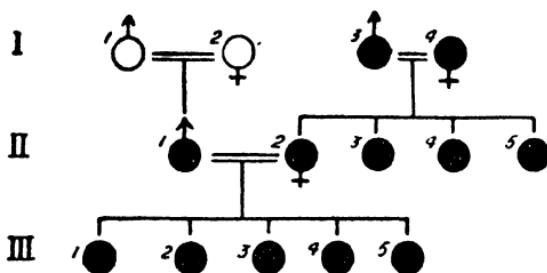
As an example, let us take a case studied by Moos. A deaf-mute man, represented by the symbol , married a normal healthy woman, represented by . They had a deaf-mute son and a normal daughter. The daughter married a normal man, and had two deaf-mute daughters and one normal son. One daughter married a deaf-mute man, and had a deaf-mute son, while the normal son married a normal woman, but his one son was a deaf-mute.

We can exhibit these relations in tabular form, the character to be traced, in this case deaf-mutism, being indicated by blackening the circle representing the individual possessing it.



This pedigree shows not only direct inheritance from parent to child, but the reappearance of deaf-mutism in a grandchild (III. 2) born of two normal parents, and in a great-grandchild (IV. 2) where both parents and grandparents were free from the affliction.

When the condition is brought into the pedigree from several sides, it usually becomes more persistent, and we get such terrible results as those shown below.



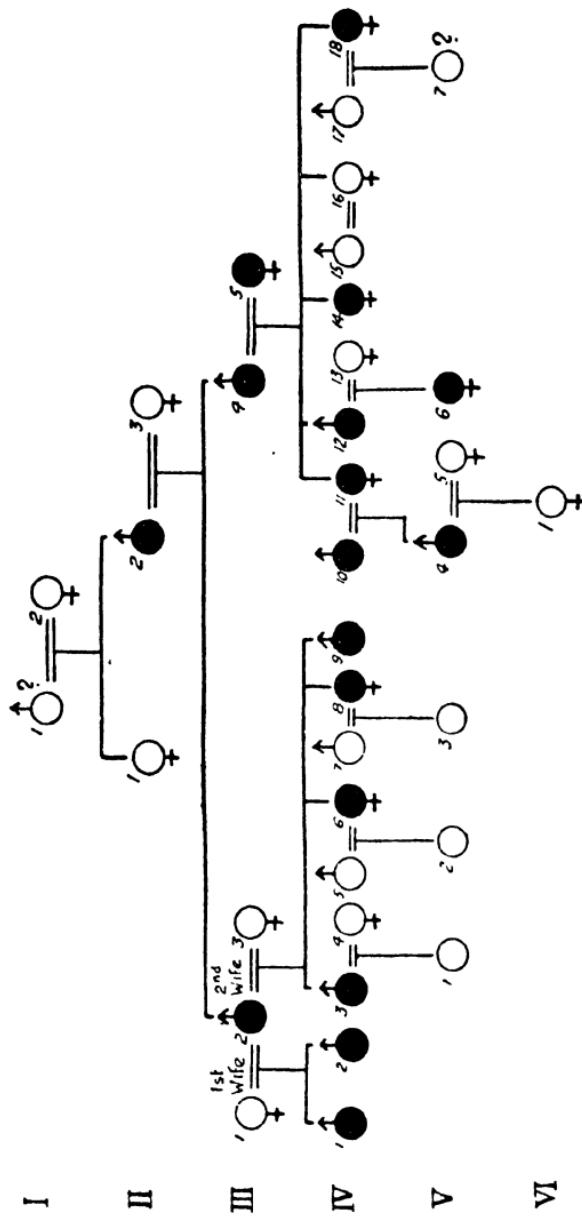
Here every member of the second and third generations is a deaf-mute.

Even with diseases which are infectious, a predisposition to the disease is often or always an hereditary character. Let us take as an example tuberculosis, which still kills about one in ten of our population. Of late years, stress has been laid on the infectious nature of this scourge, and there has been a tendency to overlook the effect of heredity in transmitting a nature prone to its attacks. Yet a glance at such a pedigree as that given below must recall us to the study of ancestral influences.

The individuals 1, 2, and 3 of generation V., and 1 of generation VI., have not yet arrived at the age when tuberculosis usually begins. Excluding these cases; and the doubtful cases I. 1 and V. 7, we have 17 individuals descended from our first pair. Of these descendants 15 are certainly tuberculous, and only 2 are classed as free from the disease.

Such pedigrees as we have considered are sufficient to suggest the preponderating effect of heredity in

Pulmonary Tuberculosis. (Klebs, Case ii.)



special cases ; but to measure quantitatively the hereditary influence, it is necessary to deal statistically with large numbers of such pedigrees. Moreover, it is not enough to study diseased stocks only. They must be taken as parts of the general population, and our statistical studies must deal with fair samples of the population at large.

The possible pitfalls of too restricted a view are better illustrated by the more difficult case of tuberculosis, which we have dealt with last, than by the more rare condition of deaf-mutism, where no question of infection can arise.

Tuberculosis is very prevalent. It affects fatally some ten in a hundred of the population. Hence in a sample of the people taken at random one or two in seventeen might be expected to suffer from the disease.

Although these numbers would be exceeded in chance cases, the probability of as many as fifteen out of seventeen in a group suffering would be exceedingly small. Nevertheless, such a conjunction would be possible, and a few such cases taken alone could not settle the question.

Again, since tuberculosis is infectious, it could be argued that members of the same family might more readily infect each other than those outside. It should, however, be noted that, as tuberculosis is, in general, a disease which develops in early mature life, and affects comparatively few children or old people, it is less likely to run through a family by infection than some other complaints. It would be much more likely to be passed by infection between husbands and wives. Some infection in these cases probably does occur, but a

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statistical investigation by Pope and Pearson has shown that such transmission is comparatively rare—too rare to affect appreciably statistical results. The disease is so prevalent that no one can escape coming within its influence. In crowded urban populations, at any rate, we may safely assign escape or infection in a large measure to immunity or predisposition.

To reach definite conclusions on the intensity of hereditary transmission, a careful statistical inquiry, based on processes the same as those used to investigate the inheritance of physical qualities such as stature, etc., must be undertaken. Professor Pearson has found by such methods that the coefficient of correlation for the hereditary transmission of tuberculosis lies between 0.4 and 0.6, and has a most probable value of about 0.5—identical with the coefficient for the transmission of physical dimensions.

Other points of interest also appear. Among them may be mentioned the fact that tuberculosis is more prevalent among the older children of a tuberculous parent than among the younger children. Similar results are found in other pathological inquiries ; the elder children are more liable to inherit the weak points of their parents. The bearing of this tendency on the effect of the decrease in the average size of modern families is obvious, and full of sinister import to the future of the race.

One of the fundamental problems in sociology is the determination of the comparative influence of heredity and environment in the production of any given character. In most cases data for the examination of the problem are wholly wanting. No figures, for instance,

are yet available to determine how many of our paupers are made so by circumstances and how many are unemployable by nature. In some cases, such, for instance, as the number who suffer from a zymotic disease like enteric fever, the main influence must probably be assigned to environment. On the other hand, we should expect the incidence of deaf-mutism to be almost entirely hereditary. But often there are no reasons for looking for an overwhelming effect of one of these influences rather than of the other, and we have no evidence available for comparing their results.

The only quantitative study yet published of the comparative influence of heredity and environment seems to be the work of Barrington and Pearson on keenness of vision and defects of eyesight. Here we have a character which we might expect to be influenced profoundly both by inheritance and by surroundings. We should expect visual powers to be innate to some extent, but to be affected largely by the surroundings and occupations of childhood and youth.

The Edinburgh Charity Organization Society has published a report on the physical condition of fourteen hundred school children in the city, together with an account of their homes and surroundings. From this report it is possible to examine the correlation of the children's eyesight with the condition of their homes. From an elaborate statistical investigation, it appears that no measurable relation exists between powers of vision and environment — overcrowding, extreme poverty, immoral surroundings, were equally without effect.

On the other hand, the influence of heredity is well marked. The statistics show that the coefficient of correlation lies between 0.4 and 0.6, thus agreeing with the intensity of inheritance of other physical characters, such as stature. The preponderating influence of heredity again becomes evident, even where we might expect that environment would play a conspicuous part.

The study of variation in mankind has been postponed till now in order that the facts of inheritance given above should be held in mind. For, leaving aside for the moment acquired characters, it is impossible rightly to understand variations in innate qualities till we have some knowledge of heredity, by which those qualities are determined.

The work of Johannsen on pure lines, described on page 30, suggests that, for variations to be transmitted by heredity, they must themselves be derived from chance germinal associations of different qualities obtained from various individuals in a heterogeneous ancestry, or, at all events, that such ancestral variations are of far more hereditary importance than others. Sports arise from the chance combination of different factors, producing an unexpected result. Drawn from different individuals in an ancestral tree, the factors form a particular conjunction, which perhaps has never before happened, and the result is a dwarf, a giant, or a transcendent genius. If some of the factors happen to have an affinity for each other, they become linked in the manner traced in recent

Mendelian research, and the sport may transmit his qualities to his descendants, establishing perhaps a definite breed, perhaps a transient strain.

In a mixed race like our own, the different types

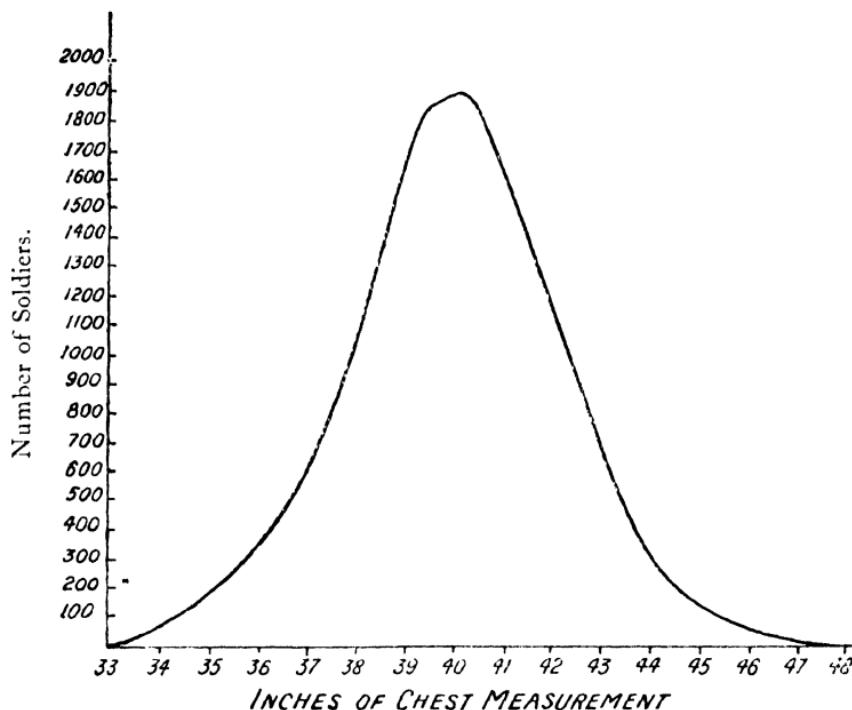


FIG. 4.

pass by such insensible gradations into each other, that the population for some purposes may be treated as a homogeneous strain showing wide variations. Almost any character of a large section of the people, when its variations are plotted, gives a curve approximating to a normal curve of error. The chest measurement of Scottish soldiers (Fig. 4), already considered on page 28, or the marks gained by

candidates in a University examination (Fig. 5), equally show this result. In the latter case, the curve is cut short at each end by the difficulty of expressing adequately in percentage marks the ignorance of the worst and the superiority of the best candidates, as compared with the mediocre attainments of the majority. But, allowing for this difficulty, the concordance is usually so good that any marked deviation from the standard curve of frequency suggests some fault in the examiner or in the conduct of the examination.

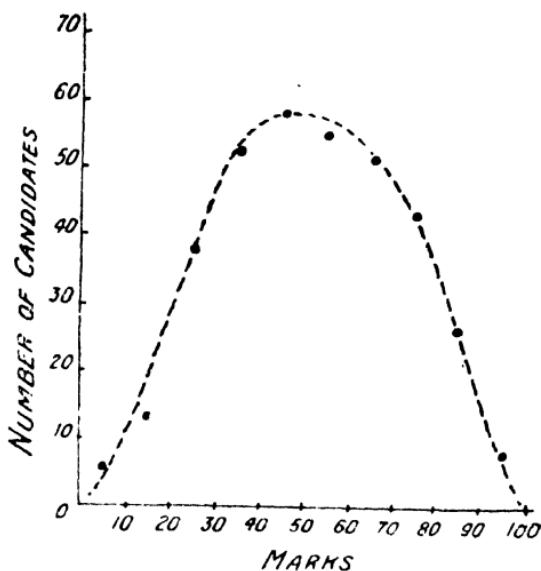


FIG. 5.

But it should never be forgotten that, when the theory of variation is applied generally to the people as a whole, this simplicity is apparent and not real. The population is made up of many different strains—of so many in fact that they shade off into each other

completely, and appear to be but the chance variations of a homogeneous stock.

The normal curve must be applied with great caution, but its usual accordance with observation shows that its general features are common to many kinds of statistics. With a fairly homogeneous section of the community, we shall probably not err in looking for many men about the average, and few diverging far from it, whether we examine physical, mental, or moral qualities.

Galton has applied the theory of variation to the statistical study of ability in man. By a careful analysis, he estimates the number of men of what he defines to be eminent ability as about 250 in each million of our population. He then divides the people into eight classes above mediocrity and eight below it, and takes the three highest classes for the eminent men. Assuming that the normal curve of error applies, the number of men in each class can be calculated. More than half of each million are placed in the two mediocre classes, one on each side of the line of average ability. As we pass away from the average, the number in a class rapidly diminishes, till the last three classes on each side contain together only about 250 in a million. On one side this number represents the men of eminence; on the other it is about enough to include the more hopeless idiots and imbeciles. An eminent man departs from mediocrity on one side as far as an idiot does on the other.

The application of the normal curve to the study of special ability seems justified by the results obtained with examinations. Nevertheless, the candidates in

such examinations are more or less selected. It is doubtful how far the normal curve would represent the facts of the actual distribution of general ability in such a heterogeneous nation as our own, with so many different types in the population. We might find, could we make actual measurements, that the experimental curve was much distorted. Still, broadly considered, the results would be of the kind indicated by Galton ; the different types of the people mingling to some extent with each other. In dealing with specialized ability, particularly in selected samples of the population, a near approach to the theoretical normal curve would be expected, and is found where measurement is practicable.

Galton's method enables us roughly to classify the differences in ability of the nation. He also showed that another estimate of differences in ability of one special kind may be obtained from the results of competitive examinations, and especially from the old Cambridge Mathematical Tripos, in which the names of successful candidates were arranged in order of merit. All these candidates are good enough mathematicians to obtain mathematical honours, and even the worst of them must be considered as of moderate ability. Yet the Senior Wrangler usually got more than thirty times as many marks as the lowest man on the list, and, owing to the limited time allotted to the examination, it is allowed that the results under-estimated the differences. The candidates were trained in similar conditions, at all events for the last three, the most important, years. Hence it follows that we must regard the ability of an average Senior Wrangler as

more than thirty times as great as the average mathematical ability of the candidates, while an exceptionally brilliant Senior Wrangler would far exceed that estimate.

There is no reason to suppose that different results would appear, could we estimate ability of other kinds in an equally exact way. The ability of a Marlborough or a Napoleon must exceed that of the average soldier by at least as much. In fact, so many different kinds of ability are needed in a successful general, that the greatest commanders must be regarded as amongst the most eminent of mankind.

Such considerations show at once the absurdity of the old fallacy that all men are born equal, and that success depends only on opportunity and environment. Men are not born equal, and in nothing do such great differences exist as in their mental capacities. We must estimate the ability of an eminent man as at least a hundred times that of the average of the race.

We now see that, even with qualities which show an insensible gradation from man to man, selection has enough variation on which to work. In the characters that follow definite Mendelian principles, we get a sharp division and segregation. A man either has brown pigment in his eyes or he has not ; he is either brachydactylous or possesses normal fingers. But, in the qualities we are now considering, no such line of division is possible. We could find men whose height lay within each tenth of an inch from five feet to six, and others who possessed every shade of general ability from that of a genius to that of a fool.

General ability is too complicated a thing to show

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simple Mendelian principles, in the present state of our powers of analysis; though certain special forms, such as musical skill, may be simpler to bring to order. In ability, and characters of an equally complex type, we cannot at present trace simple rules. But the inheritance of ability is a subject of such importance that it must be treated alone at a later stage of our inquiry.

CHAPTER IV

THE INHERITANCE OF MENTAL DEFECT

THE problems connected with the inheritance of mental defect have sprung into importance in recent years. It is only within the last century that the mentally defective have had much chance of survival for themselves, or any prospect of handing down their diseased condition into another and yet another generation. Before that period, the wardship of idiots and lunatics had regard chiefly to the control of their lands and estates in the interests of the Crown and the next of kin, and was only gradually elaborated into some attempt to control their persons also; while those lunatics who had no possessions were left to the tender mercies of their relations or to the care of charitable persons and the parish. Even in criminal law the plea of insanity was unavailing except in extreme cases. In fact, the general feeling in the society of the period seems to have been that insanity itself was a crime, or at the very least the punishment of a crime. The repressive measures founded on such a belief were severe and effective; there was little opportunity of discovering whether mental defect was or was not transmissible by heredity.

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In the beginning of the nineteenth century, public attention was drawn to the pitiable condition of the insane, either when incarcerated in prisons and asylums, or when wandering at large. A scientific study of insanity began to correlate the phenomena observed with other forms of mental and physical disease, while popular novelists, such as Charles Dickens in *Barnaby Rudge*, drove home to the public mind the inhumanity of the then methods of treatment and non-treatment. A long series of lunacy laws has followed on the awakening of the national consciousness in this matter.

But a recognition of the evil did not at once produce a knowledge of the issues at stake. As is usual in all legislative interference, the individual at first is dealt with *per se*; the surroundings in which he was bred, their effect on him and his on them were ignored. According to the mid-Victorian concept, a man was either sane or insane—quite mad or completely cured. How he became mad, how completely he was cured, were not taken into consideration. When he was once discharged from the asylum or refused admission to it on the grounds of insufficient mental defect, like the man in the old song,

Whither he went and how he fared,
Nobody knew and nobody cared.

Such a method of treatment has had its natural effect in the extension by inheritance of mental infirmity. In the beginning of the twentieth century it became necessary to appoint a Royal Commission to inquire, not into the crowded state of the lunatic and idiot asylums, but into the provision for guardianship

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and control of a whole new class of citizens, the feeble-minded.

The investigation was conducted on expert lines ; medical investigators were appointed, and particulars were obtained of the manner in which foreign countries and the colonies were dealing with the question, pressing alike wherever our Western civilization has taken hold. The Commissioners divided their " material " into nine classes.

Firstly, persons of unsound mind, a term equivalent to the word lunatic, indicating disorder of mind rather than any obvious congenital defect or malformation. These are the persons for whom the asylums were originally planned, and the Commissioners state that they are still the only class of mentally defective people adequately provided for by the State *on account of their mental defect*. The other eight classes contain all degrees of mental infirmity, from idiots who are incapable of shielding themselves from common physical dangers, to the feeble-minded, who can earn a living in favourable and carefully guarded circumstances ; from moral imbeciles, on whom training and punishment has little or no deterrent effect, to the more hopeless inebriates, who drink, not from deliberate choice, but from lack of self-control and power of will.

The Commissioners estimated that the number of those persons who, while not certifiably insane, are suffering from mental defect, is about 150,000, to which must be added the population of our lunatic asylums, public and private, of our idiot asylums, and from the point of view of the sociologist, of those persons also who, having passed through the

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asylums, have been discharged as cured or incurable, and are now in uncontrolled liberty amongst us.

From all sides evidence was offered to show that the feeble-minded, though not recognized as such by the State, were nevertheless frequently being treated and maintained by the nation in ways that were not only expensive but were entirely unsuited to the nature of the case. Thus it is noted that many mentally defective children have immoral tendencies, partly owing to their deficiency of self-control, and partly because such children are peculiarly open to the power of suggestion, so as to place them at the mercy of bad companions. They begin their career of crime at an early age; for a long time they profit, to their extreme detriment, by First Offenders and Probation Officers Acts; then come utterly useless short sentences, and a life spent alternately in prison and workhouse—unamenable to the discipline of either, and outcast from both. At present the commission of a serious crime and the imposition of a long sentence is perhaps the best hope for these unfortunate individuals and the society on whom they prey. A medical officer of one of the large prisons, where juvenile boy offenders are admitted, considers that forty per cent of the boys are feeble-minded.

The same class of information comes from those people who are concerned with the working of the inebriate asylums. It is, moreover, notorious that, while prisons and lunatic asylums are provided in sufficient numbers to contain all those individuals who are consigned to their sheltering care, the inebriate reformatories are wholly inadequate in number, and are

reserved for the most part, by the especial providence that watches over our social legislation, for those who can afford to pay for a long and expensive course of treatment. No really destitute person need apply ; habitual cases of this sort are still treated by short terms of imprisonment. But, in spite of these restrictions, which probably have the effect of raising the social status of the inhabitants of Homes of Retreat, it is estimated by the authorities concerned that seventy per cent of these unfortunate people are mentally defective, probably irreformable. They are not drunkards in the sense of suffering from the drink craze ; they are primarily feeble-minded, and probably would never have acquired the vice had they been earlier placed and kept under control.

It is interesting to note that the general opinion of these specially competent witnesses is that "alcoholism in one or both parents exerts its influence mainly by impairing the vitality of the children. . . . It has not any special tendency to beget a proclivity to drunkenness in the offspring, but, in the manner indicated, has a distinct influence in the production of feeble-mindedness and epilepsy. . . ."

Another section of the report of the Commission deals with the prevalence of sexual immorality among the feeble-minded ; and here the evidence comes chiefly from those who are acquainted with the subject through the work of the Rescue Societies and the workhouse maternity wards. The lack of self-control which is noticeable among feeble-minded boys, and drives them ultimately into the prisons, sends the girls on to the streets, to become the prey of the first

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evil-minded person they meet. There is also often a definitely immoral tendency, which shows itself at a very early age, and is borne witness to by parents and school-teachers. The existing provisions for dealing with girls of this class are hopelessly inadequate ; they are “ins-and-outs” of the workhouse maternity wards. Some thirty per cent of them are considered too bad to keep even in Penitentiaries ; they lower the standard of discipline and work, and, by reason of their wandering, vacant minds, they cannot be persuaded without compulsion to carry on remunerative employment. So they go back to the streets to increase and perpetuate the race of the feeble-minded.

The Commissioners did not consider that they were empowered to conduct a scientific inquiry into the causation of mental defect ; but, in the course of their investigations, a mass of evidence on this point accumulated. Twenty-five out of thirty-five witnesses attached supreme importance to a history of mental defect in the parents or near ancestors, and the general opinion was that there is no such thing as manufactured feeble-mindedness, apart from very rare accidental injuries. In fact, as we should suspect, mental defect dating from birth or observed in the early years of childhood, is declared to be spontaneous originally, by which is meant “not induced by external conditions,” and afterwards truly hereditary. The various forms of mental defect, whether imbecility, drunkenness, crime, immorality, are not primarily separate subjects for investigation and treatment, but merely accidental concomitants of a diseased pathological condition.

It is possible that mental defect, like hereditary ability at the other end of the scale, is no simple quality; but, although complex in its character, it is probably a simpler aggregation of factors than transcendent genius. Mental defect is easier to define, easier to recognise, and therefore easier to trace. In many cases the physical malformations are manifest to every one; the want of mind of the imbecile is as obvious as the aberration of mind of the lunatic. Border-line cases there must be; but these, too, will often slip into their correct classification in periods of mental strain, of excitement, of ill-regulated life. Whether we shall ever be able to separate out the various strains and deal with each of them as a definite Mendelian unit remains to be seen; at present, at any rate, the many pedigrees of degenerate stocks that have accumulated help us to realize the interchangeableness of some of the various manifestations and the direct influence of heredity on their transmission from parent to offspring.

Two such pedigrees are given below, to illustrate the descent of mental defect in its various forms through four generations.

CASE I

Father, = Mother,
eccentric. | insane.

daughter,
mentally defective—unmarried.

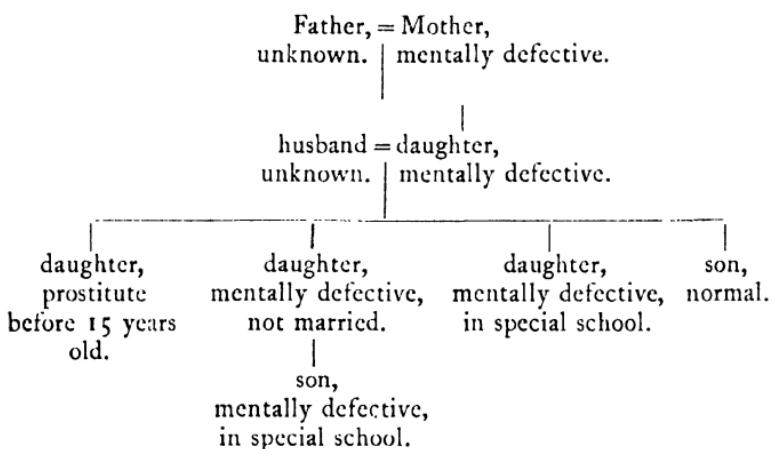
daughter,
mentally defective.

twins.

daughter,
died at 1 month. daughter,
died at 6 months.

daughter,
almost imbecile—
at present detained under
Industrial Schools Act.

CASE II



These family histories have been supplied through the kindness of a member of a special school authority. It may be as well to point out that such authorities have no power at present to detain the children in the special school, or to commit them to any other custodial care after the age of sixteen. It must be remembered also that such pedigrees are highly incomplete ; the very fact of the mental defect of the persons involved increases the difficulty of any efforts to get accurate and full family histories, and there is at present no general central office of sociology where the history of such families can be followed, as the persons composing them pass from special school to refuge and workhouse, and from the reformatory to the police courts, the prisons, and the asylums.

It is an evident fact, yet one often overlooked, that those who, through mental or physical defect, are unable

to support themselves, become a charge on the community. Whether they are supported by public funds in workhouses, asylums, or prisons, or whether they form an even heavier, because more localised, burden on their relatives, they involve a tax on others, and necessitate the expenditure of unproductive labour.

A large proportion of the petty crime of the country is due to feeble-mindedness ; much of the pauperism is caused by mental or physical infirmity. Such qualities are hereditary, and the direct cost to the normal members of the community of the descendants of a single criminal or feeble-minded pair is often appalling. One such case has been investigated fully, that of the notorious "Jukes" family in the United States of America. The pedigree contains some 830 known individuals, all descended from five sisters born about 1760. A large proportion of these individuals have been in prison, some of them for serious crimes. Frequently the women have consorted with criminals. Many of the race have been paupers, partially or wholly supported by the country. The total direct loss to the state caused by this one family has been calculated as about £260,000, while the indirect loss cannot be estimated.¹

Those familiar with our country villages recognise that feeble-mindedness is specially rife in certain localities. The cross-marriages between a few neighbouring families, in which mental defects are hereditary, produce gradually a feeble-minded population. The present tendency for the abler youth of the country to drift into the towns, leaves the inferior stocks behind in the

¹ *The Jukes*, by R. L. Dugdale : New York, 1884.

villages. Thus it comes to pass in some districts that the country, which supplies the most natural and healthy environment, becomes populated with a lower kind of humanity. By the continued removal of the best elements, the remaining inhabitants are left to breed to the worst type of the people.

In dealing with the various aspects of the problem of the mentally defective, we have left to the last the all-important question of the rate of their reproduction. There is undoubtedly a very high mortality among their offspring. We should expect this mortality, both on account of the constitutional weakness which seems to accompany many forms of mental defect, and also from the fact that feeble-minded parents cannot and do not bring up their children with even the average sense and care belonging to their station. Drink, crime, vice are rife in their homes; unemployment is the normal occupation of the breadwinner; neglect and ill-treatment increase the incidence of physical infirmity. Yet with all these checks, the unrestricted fertility of the mentally defective is sufficient to constitute a serious menace to the race; serious at any time, but more so at a period when the decline in the birth-rate among the better-educated and more self-respecting classes is so unmistakable as to cause alarm even to statesmen. It is not surprising that the ratio of the number of insane persons under the control of the Commissioners in Lunacy to the number of the population at large has increased by ninety-two per cent in the last fifty years.

On the two points of the fertility of the feeble-

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minded and the probable degeneracy of their offspring the evidence from institutions and the opinion of medical men is in substantial agreement. Dr. Tredgold, an especially experienced witness, pointed out that the average number of children in the families which now use the public elementary schools is about four ; whereas in the degenerate families whose children are passed over to the special schools, there is an average of 7.3 children, not including those still-born. The following table was prepared to show the condition of 150 mentally defective children with their brothers and sisters. In the 150 families there were 1269 children born.

	Unsatisfactory.	Satisfactory.
A. Born dead . . .	170	
B. Since died—		
Under 1 year . 138		
" 3 years. 107		
" 10 " . 37	315	Said by parents to be mentally and bodily healthy . 456
" 20 " . 8		
Over 20 " . 25		
C. Mentally affected . .	245	
D. Discased, paupers, or criminals . .	83	
Total . .	813	Total . . 456
		Total, 1269

The high rate of mortality is noticeable, and also the fact that only one-third of the offspring were accounted,

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even at the parents' valuation, to be normal members of society, while 328 persons, the descendants of 150 pairs of parents—not necessarily both feeble-minded—showed definite mental disease in some form or other, a considerable increase in one generation. Again, it was noted by the Commissioners that in one workhouse alone, sixteen feeble-minded women had produced 116 children, and out of one such family of fourteen, only four had been able to do remunerative work.

The lack of moral responsibility in the individuals who create such offspring, and in the society which tolerates or encourages such a proceeding, is appalling. Verily, if it needs must be that such offences come into this world, woe unto that man or woman by whom the offence cometh !

CHAPTER V

THE INHERITANCE OF ABILITY

ABILITY is among the most valuable possessions of a race. Efficiency in government, profession, business, or trade depends largely on the innate ability of the different classes of the community. Success in the struggle of nation with nation in war or in economic competition attends the most able and best-organized people.

But other qualities may be of equal or greater importance than ability. Moral character, good health, physical strength and grace, beauty, and the supreme charm which often accompanies long lineage and gentle nurture, all are to be desired, and should be cherished and encouraged no less than ability.

But, at present, records of ability are more accessible than those scattered allusions which alone would enable us to trace the inheritance of other good and noble qualities. Moreover, from the point of view of heredity, we might expect them to follow somewhat similar laws of descent.

We may, then, take ability as an example of those qualities we desire to encourage, always remembering that it is but an example, and that health and beauty of

person and of character are equally necessary for the perfection of mankind. We may hope in future that such qualities will appear in pedigrees alongside the more showy honours which come to him who possesses and knows how to use ability of intellect.

All these desirable qualities are, from the point of view of heredity, essentially different from some of the bad qualities hitherto considered, in that they depend on the conjunction of a great many factors. Such a conjunction must be very hard to trace in the hereditary process, where possibly each character may descend independently, or different characters may be linked together, or be incompatible, in far more complicated ways than we have traced in the qualities of plants and animals. Our present knowledge is quite insufficient to enable us to predict how a complex combination of factors making up the personality of an able or charming man or woman will reappear in their offspring. We can but follow empirical lines of inquiry, and reach certain general conclusions to be discussed later.

Many undesirable qualities—tendencies to disease, insanity, feeble-mindedness, deformity—depend on the inheritance of some one definite pathological condition, which can be traced, as we have seen, from generation to generation, sometimes in accord with regular Mendelian principles. Here our knowledge is surer, and a much safer guide. We know that a certain proportion of the children of unsound parents will possess the unsoundness. We can calculate the effect on the race of allowing numbers of such parents to marry.

But, notwithstanding the complication of the pro-

cess, it is certain that ability, and the other desirable qualities which depend, like it, on the conjunction of many factors, are inherited also.

Thus, although we cannot analyse completely ability or beauty into a number of definite Mendelian factors, we are safe in supposing that we shall tend to improve the average ability and beauty of the race by encouraging the growth of families in which those qualities are manifest, and discouraging those in which they are deficient. Whether our knowledge eventually becomes more exact, or whether we find the complete analysis of the problem for ever too difficult for solution, the general facts of inheritance remain. We may never be able to predict more than roughly the probable ability of the children of any one union; but we know already that, in a large number of unions, we may look for a general resemblance between parents and children both in body and mind. We can predict the effects on the nation, perhaps on the family, though not with certainty on the individual.

The first to point out the overwhelming effect of heredity in the history of ability was Sir Francis Galton. His great work *Hereditary Genius*, published in 1869, marks an epoch in the evolution of sociology, though the prevailing individualist philosophy of life prevented it from receiving adequate recognition till recent years.

Galton pointed out that the results of examinations, such as the old Cambridge Mathematical Tripos, showed that, instead of men being born equal, as was believed in the nineteenth century, one man had natural abilities

which, measured against those of some other men with similar training and opportunities, must be reckoned to be at least as thirty is to one.

In attempting to trace the inheritance of ability, we are met at once by the difficulty of detecting it, and of measuring it accurately, save in the extremely limited and specialized sphere of competitive examinations. How can we decide whether a man whose time is passed in the usual occupations of life is to be classed as of average intelligence, as able, as eminent, or as illustrious?

While the difficulty in distinguishing between the average and the able men by an inspection of ordinary records is probably insuperable, it seems likely that men fairly described as eminent or illustrious may be marked out from their fellows with some approach to completeness.

As Galton points out, such men possess abilities which can hardly be concealed by any disadvantage of birth or position. The small number of men in each generation who reach eminence are drawn from all ranks of the community, and overcome with comparative ease all obstacles in their path. The few in each century who are acknowledged to be illustrious, the Shakespeares, the Napoleons, the Newtons, take, even in early manhood, their predestined place. But to be fairly certain that the men whom we have called eminent have come to the front, it is wise to restrict our investigations to men of mature age. Galton decides that, by the age of fifty, such men nearly always will have made their mark.

The next question that arises is what test of eminence in ability to apply. High official position is

sometimes reached by devious ways. Reputation in the world at large is sometimes but ill adjusted to merit. Nevertheless, a high reputation among those of acknowledged position in the man's own special sphere is a very good test of his real worth. Few competent men who have studied a subject, and few among the abler members of a profession, could fail to point out the five or ten acknowledged masters in their special line who appear in a decade. Much greater difficulty would be found in naming all the many individuals who must be described as able rather than average. But the few of real eminence are usually known to all who understand their special subject.

It is in this sense that Galton defined eminence. He excluded notoriety obtained by a single act, and restricted his list to those men "who have distinguished themselves pretty frequently either by purely original work, or as leaders of opinion."

He passed on to estimate the number of such men. He studied the columns of the book of reference then known as *Men of the Time*, which, with enlarged boundaries, is now represented by *Who's Who*. He decided that in the British Isles about five hundred men over fifty might fairly be described as eminent. At that time (1869) there were about two millions of men over fifty years of age in the British Isles. It followed that the proportion of eminent men was about two hundred and fifty to a million. Two other means of calculation were adopted: one from the obituary notices for the past year published in the *Times* on 1st January 1869, and one from obituaries of many years back, when the population was smaller. In each case

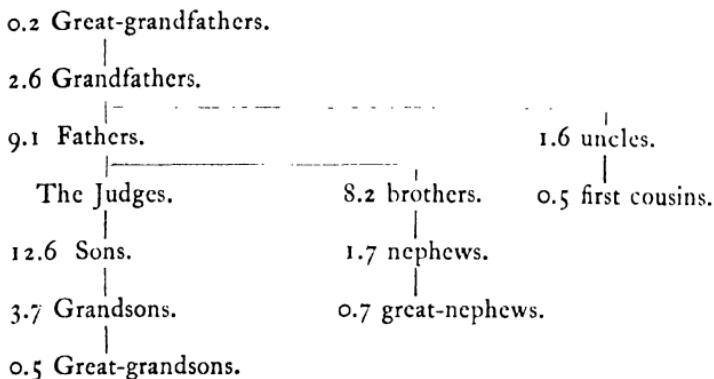
an estimate of about two hundred and fifty in a million was obtained. We may accept this number, then, as the proportion of men of eminent ability in the population as a whole, at all events for the periods considered by Galton.

An independent value has been obtained by the editors of the *Dictionary of National Biography*. They estimate that, in the British Isles throughout the historic ages, one person in every five thousand who have reached adult life, that is two hundred to each million, have been of sufficient eminence to secure admission to the Dictionary.

Galton's next task was to trace the inheritance of ability which might fairly be reckoned as eminent. By examining the records of all the Judges of England between 1660 and 1865, the Statesmen of the reign of George III., and the Premiers of the last century, Galton proved that they had many more relatives who themselves showed eminent powers of mind than the total number of their relatives would lead one to expect, if ability were not hereditary.

Not only have eminent men like the Judges a larger number of eminent relatives than chance would suggest, but the number increases rapidly with the nearness of relationship to the Judge. Of the fathers of the Judges a proportion of 9.1 in 100 were found by Galton to be eminent men, while of 100 sons 12.6 were of the same class. The percentages of more distant kinsmen who could be reckoned as eminent are shown in the following table:—

PERCENTAGE OF EMINENT MEN IN EACH DEGREE OF KINSHIP TO THE
286 JUDGES OF ENGLAND BETWEEN 1660 AND 1865.



The percentage of eminent relatives in still more distant degrees of kinship was found to be inappreciable, at all events below 0.1.

These results are very remarkable. When it is remembered that, on Galton's scale, the proportion of eminent men in the population is only about two hundred and fifty in a million, or 0.025 in a hundred, we see how much more likely eminent abilities are to be found in the fathers, sons, and brothers of eminent men than in the mass of the population. The chance of the son of a Judge showing great ability is five hundred times as great as that for a man taken at random.

From the point of view of heredity, these results would be strengthened immensely if particulars and estimates of ability were available and forthcoming in the cases of the wives of the men considered. The ability of women, naturally destined to be used in work even more honourable and important than that of men,

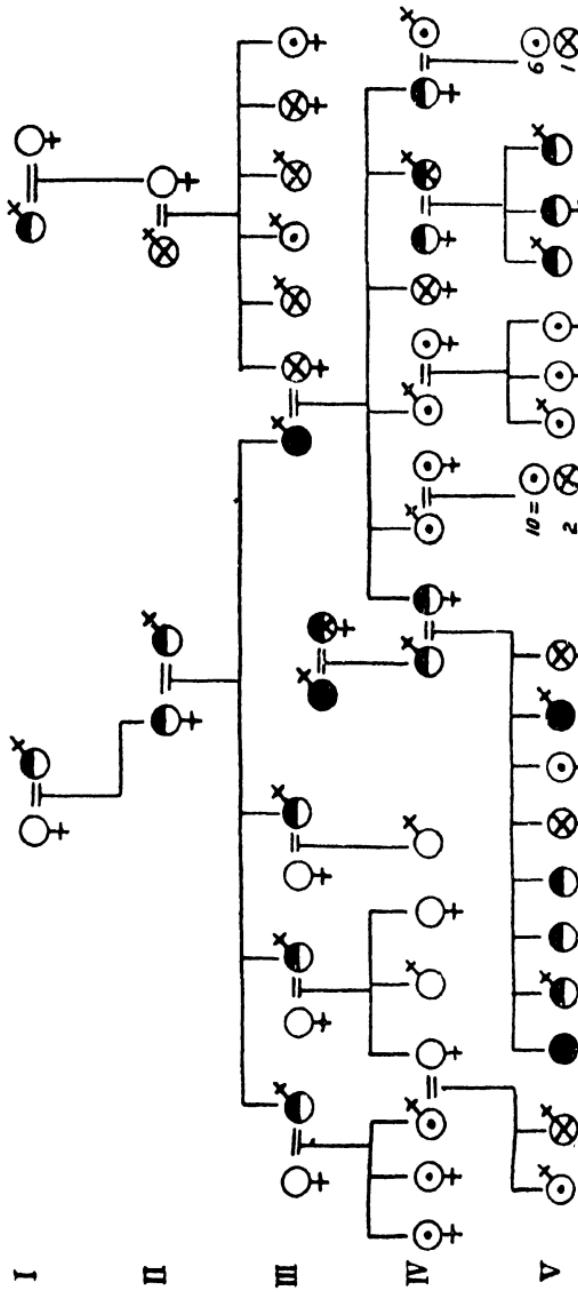
makes less noise in the world, and very seldom gets noticed in public records. Hence it is impossible to solve the problem of the relative average ability of the children of Judges who married able women as compared with that of the children of Judges who married stupid or dull women. The only light we can throw on the subject comes from the significant fact that a considerable number of the Judges whom Galton classes as the fathers of eminent sons married wives with well-known or distinguished relatives.

To examine the all-important problem of the effect of both parents on the inheritance of ability, it is necessary to study recent pedigrees, filled in with more scientific detail than is found in older family histories. A fairly large collection of such pedigrees is now available. The following tables illustrate the phenomena observed, and show clearly the essential part played by the choice of mates in family inheritance.

Since we are obliged to deal with persons now living, in order to get pedigrees sufficiently detailed, it is seemly in some cases to omit names, and to make a few immaterial changes, such as varying the order of the children in the different families, in order to prevent a too-ready identification.

In Pedigree I. we see the effect of the marriages of four able brothers, having an able ancestry behind them, with women who show no marked ability. These brothers are indicated by the symbols placed 2nd, 4th, 6th, and 9th from the left in Generation III. None of the progeny of the first three, who married undistinguished wives, has come to the front in any way.

PEDIGREE I.—Ability.



Symbols used—1. ♂ = male. 2. ♀ = female. 3. ● = great ability. 4. + = ability above the average.

5. ♂ combination + and x. 6. ♂ = unsound in mind or body. 7. ● = normal.

8. ○ = characteristics unknown, probably normal.

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The fourth brother, by far the ablest, married a woman of unsound stock with ability in one of her grandparents. The result was a family of two sound normal members, one unsound, and three with ability, two sound and one unsound. Two of the able members of this family married ability, and the results appear in the family of three able persons shown in V. 14, 15, and 16, and in the remarkable family V. 3 to 10, two members of which showed ability of a very high order; one of them was a most influential person of the time; three others were able much beyond the average, while the ancestral strain of unsoundness came out in the remaining two.

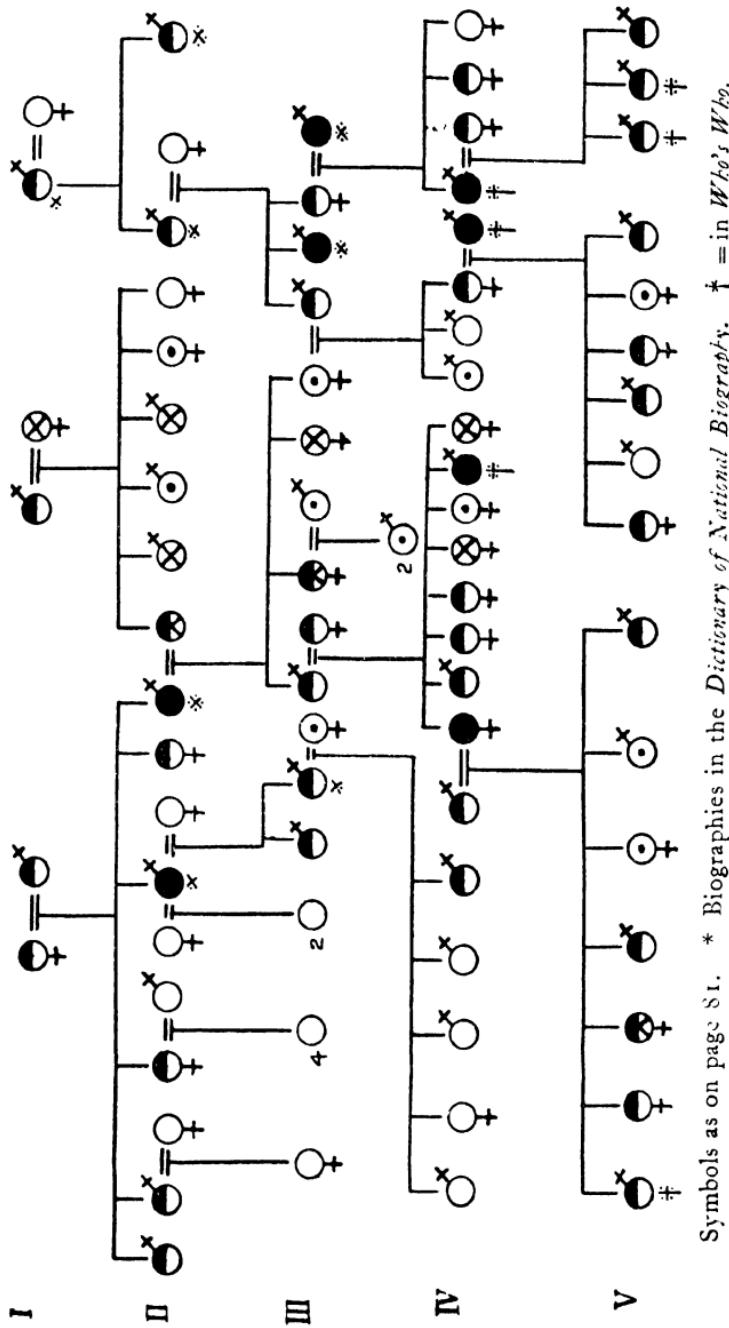
This pedigree is also interesting in that it illustrates the fallacy which lies in the common idea that great ability is often associated with unsoundness of mind or body. The truth is that ability and unsoundness usually enter a family from different sources, and are transmitted independently of each other. Sometimes they chance to coincide in the same person, but more often they become separated in different individuals.

Pedigree II. shows the ancestry of the same family on the paternal side, and its alliances with two other distinguished families, many of whose members are recorded in the *Dictionary of National Biography*. Here the same definite inheritance of ability is shown, and the same phenomenon of a strain of unsoundness running through one line of descent. From our immediate point of view, it is well to call attention to the two able members in Generation III. of the well-known family represented on the right of the diagram. The man married a "normal" woman, and

THE INHERITANCE OF ABILITY

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PEDIGREE II.—Ability.



Symbols as on page 81. * Biographies in the *Dictionary of National Biography*. † = in *Who's Who*.

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had two undistinguished and one able child, while the woman married a very able man and had one very able son, one able daughter, and one whose characteristics are unknown. Thus once more the quality of the alliance shows clearly in the average quality of the offspring. The individuals indicated in the last line, or Generation V. of this pedigree, are believed to be under forty-five years of age, and therefore have not yet completed their careers. It is possible that some of them will still show powers entitling them to the distinction of being reckoned as "very able."

A study of pedigrees and biographies in such books of reference as the *Dictionary of National Biography* leads irresistibly to the conclusion that continued ability and eminence in a family depend solely on sound marriages. That some families remain in a prominent position for many generations is a historical fact. The Scopes, for instance, in the course of the three centuries comprised between the reigns of Edward II. and Charles I. produced, in the male line only, "two earls and twenty barons, one Chancellor, four Treasurers, two Chief Justices of England, one Archbishop and two Bishops, five Knights of the Garter, and numerous Bannerets."¹ The permanence of the ability maintained by the intermarriages of the Montagues, the Norths, and the Sidneys has been pointed out by Galton.

The family descended from Roger Boyle, a Herefordshire gentleman of good birth, and Joan Naylor his wife, a couple living in the time of Queen Elizabeth, provides one of the most striking instances in modern

¹ *Times*, 17th June 1909, obituary notice of Mr. Simon Conyers Scrope of Danby.

English history of the descent of ability and its recognition by the grant of hereditary titles. Among the children of Roger and Joan Boyle two are specially noteworthy. One, Michael, had many distinguished descendants; among his sons were a Bishop of Waterford and an Archbishop of Tuam. The other, Richard, was the great Earl of Cork, whose descendants in the male line received between them some ten or twelve titles. In a single generation four members of the family were elevated to the House of Lords, while one of the most illustrious, Robert Boyle, the great philosopher and man of science—a seventh son and fourteenth child—repeatedly refused a peerage. After two marriages with co-heiresses, the senior branch of the house was extinguished in the male line. It has been represented for the last four or five generations by the Dukes of Devonshire, who, through a female descent, have become possessed of the Earldom of Burlington, one of the many Boyle titles.

As long as ability marries ability, a large proportion of able offspring is a certainty, and ability is a more valuable heirloom in a family than mere material wealth, which, moreover, will follow ability sooner or later.

It is impossible to foresee the mode of development of our social organism. It may be that the lineal inheritance of material wealth by successive generations will cease to be compatible with the institutions of a future stage of civilization. But, whatever be the political or social constitution, ability must always make its mark, and remain as a very real form of capital to the individual and the family who possess it. In the distant future, capital, in the ordinary sense of the

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word, may possibly be owned chiefly by the State; but health, character, and ability are assets which cannot be divorced from the individual. They must yield an annual return of interest on which he and his family may flourish and multiply. Such qualities are an inherent possession of the individual. They are his to use and to hand on as he will, for the advantage of the nation. No collectivist state can deprive him of their possession, and any environment which makes him disinclined to use or to transmit this innate capital is an irremediable misfortune to the community. The inborn qualities of mankind, whether good or bad, may be established, maintained, and extended in a family by, and only by, appropriate marriages. In past ages long and honourable lines of descent were based jointly on ability and on inherited wealth. If, at some future time, the latter condition be set aside, the former can yet remain; and we may look with confidence to the continuance in high position, from generation to generation, of those families whose members choose their mates for all good qualities of mind and body.

To the student who wishes to gain a clear idea of the influence of heredity, nothing is so illuminating as to select some marked feature in himself or his acquaintance, and search for its introduction into the family. It is surprising how often the track of ability or lack of intelligence, of strength or weakness of mind or body, can be traced back in a definite line of ascent for several generations. The construction of pedigrees like those given above is fascinating in the light it throws on such problems.

The inheritance of various kinds of special ability

may be traced no less clearly than can the general ability hitherto considered.

Galton gives a remarkable pedigree of the Bach family extending to eight generations, all showing great musical talent, which gradually increased in intensity for four generations, culminated in John Sebastian Bach (1685-1750), and diminished again in his descendants. To investigate the causes of the rise and fall, further knowledge of the women than Galton gives is necessary; but it is known that at that date young musicians frequently sought their wives in families belonging to the Guild of Musicians.

A family showing the descent of qualities of a very specialized nature—religious fervour, combined with a musical and emotional character—is that of the Wesleys, of whom the best-known members are John, the founder of Methodism, and his brother Charles, the hymn-writer, fifteenth and eighteenth children respectively. Their grandfather and his brother were among the non-juring ministers ejected in 1662; while the sons of Charles, Charles and Samuel, were well-known organists and composers; and a grandson, Samuel Sebastian Wesley, who died in 1876, was also an organist and composer.

Galton notices that some apparent exceptions to the general law of inheritance of special characteristics are explicable if we regard instability of disposition as a heritable factor.

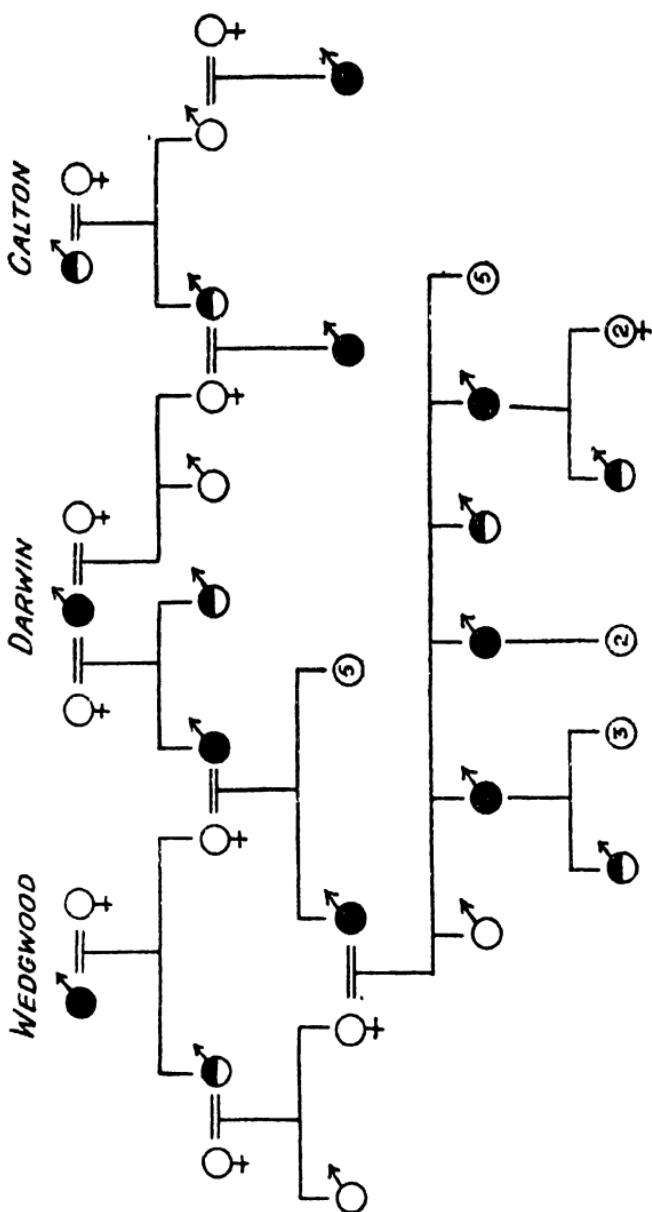
For example, certain types of excitable religious feeling flourish best in minds liable to want of balance, and subject to alternative periods of great depression and of high exaltation. Here we have probably two

separate characters at least — religious feeling and instability. These characters may be transmitted independently. If once more they chance to coincide in a child, the complete parental type is reproduced ; but if they be separated, one son may possess religious feeling of a steady normal type, while another, inheriting instability unchecked by religion, and finding of necessity the home environment uncongenial, may go to support the common idea that the sons of extremely religious parents are apt to run to excess in riotous living.

As the nations of modern Europe crystallized out of the mediæval chaos, the inheritance of military and political ability in certain families originated and maintained aristocracies of the sword and of statecraft. In our own early history who can overlook the ability manifested from generation to generation by the families of Alfred, of Godwin, of Warenne, of Clare, of de Montfort ?

In later times arose an aristocracy of the law, in which Lord Keepers and Lord Chancellors are found as the descendants or the ancestors of lesser legal luminaries. As each special type of ability became of paramount importance to the nation or the race, representatives of that ability, rising from all ranks, forced their way to the front, and left offspring to maintain or expand the benefit of their qualities to mankind. Cases illustrating this point will be treated in the next chapter.

In our own times, superposed on the ever-living need to defend our homes and interpret our laws, came



is a man of scientific ability ; (2) shows a man of scientific ability, who is also a Fellow of the Royal Society ; (3) shows five other children, and so on.

the vast extension of commerce, industry, literature, and education, and the birth and development of modern scientific discovery. Hence, side by side with families who rise into prominence by the old means of arms and the law-courts, we have coming to the front Rothschilds and Barings, Wedgwoods and Arkwrights, Murrays and Longmans, Arnolds and Butlers, Darwins and Listers, showing long-continued hereditary aptitude for finance, manufacture, education, or science.

As an illustration of the growth of one of these new kinds of aristocracy, the aristocracy of science, let us take the remarkable family of Darwin.

Beginning with Erasmus Darwin (1731-1802), poet, philosopher, and physician, we have two lines of descent, leading on the one side to Sir Francis Galton, and on the other to Dr. Robert Darwin, and his son Charles Darwin, the great naturalist, of whose sons four show scientific ability. In five generations, the family of Darwin, and the allied families of Wedgwood and Galton, have produced no less than sixteen men of scientific attainments, of whom nine were Fellows of the Royal Society, and ten were lineal descendants of Erasmus Darwin. Who can estimate the value to the nation and to mankind of such strains of blood, and the importance of sustaining or increasing the number of individuals to whom such qualities may be transmitted?

In studying the inheritance of scientific ability, let us emphasize the untold injury done to mankind by the condition of celibacy formerly imposed on the Fellows of the Colleges of Oxford and Cambridge, as a relic of their old monastic tradition. Had Erasmus

Darwin when at Cambridge chanced to obtain a Fellowship and to live on in academic life, his special qualities would have died with him, and the world would never have known Francis Galton or Charles Darwin and his sons. But though Erasmus Darwin escaped, countless other men of science and letters did not marry at all, or, marrying when at an advanced age they were independent of their Fellowships, were too late to leave descendants to transmit their priceless qualities. What England, nay, what mankind, has lost is beyond all power of calculation, and is gone for ever. The pious founders of our colleges may have done more harm than good to the nation they sought to serve, to the race to which they belonged.

The restriction of celibacy was removed in 1882, and already the inheritance of academic ability has become clear in the annual elections to scholarships and fellowships at Cambridge, and in the other distinctions of the University. Sons of Fellows and past Fellows are now rapidly coming to the front in numbers far beyond those which any possible chance distribution of ability would involve. The pity is that, with the prevailing fashion of small families, such sons are so few in number.

CHAPTER VI

THE RISE OF FAMILIES

THE rise and fall of families is an ancient theme. Poets, ballad-mongers, writers of romance, heralds, historians, have made it their own. The Percys, Bohuns, Mowbrays, Plantagenets have passed away in the direct male line ; the star of the Veres, the bend or of the Scropes, the chevron of the Clares, can no longer be carried in the first quarter of any shield in the Peerage. Families get used up, we are told, and go to seed. Or they are pursued by ill-luck, and fight in vain against the stars in their courses. Last in the field among the chroniclers of family history have come the men of science, to pick up and arrange the crumbs left by the earlier gleaners.

Now science does not accept ill-luck as an *a priori* argument, and the plea of being "used up" is met by the inquiry as to what steps were taken to replenish the soil and improve the seed. Here the chroniclers are silent, or at best unwittingly give information in roundabout ways. Still, if a record has been kept with any substantial amount of accuracy, there is a great deal to be extracted from the perusal of it. It does not require a very profound study of the Peerage

to deduce the results attending marriages with heiresses, and possibly, could we examine contemporary records, and draw upon the personal knowledge of one or two generations of contemporaries, we should gain a clearer insight into the nature of the ill-luck that pursued or led astray the great families of ancient days.

Family history, as far as it is given in any printed and published work which can be bought in the open market or consulted in general reading-rooms, is public property. There is no breach of confidence involved in any further use of it. Unfortunately, it consists for the most part of lists of names and dates ; the details of history, character, and occupation are few, and much of the utility of such records is lost for scientific purposes. The accurate observation and careful entry of the characteristics of each individual unit of a family group is a modern conception, carried out only by a few persons. Since many of the subjects may be still alive or live in the memory of others, such studies do not admit as yet of full publication, either with names or with details that might lead to identification.

So, for the purpose we have in hand, which is the elucidation of the causes of the rise and fall of families, we have two classes of evidence available. The first consists of the published records, with names, dates, and scanty details ; the second is a series of pedigrees which have been privately collected, and set forth, to the best ability of the recorders, the virtues and vices of various representative families.

One of the most marked of the general features in the rise of families, who remain in a position of stable equilibrium, is their slow and gradual ascent. The

members have time to get acclimatized to their new position and fresh responsibilities before the next onward move. It also becomes evident that the same class of ability is usually manifested through several centuries, whether that ability be military, diplomatic, or commercial, giving a very definite impression of the varieties of talent that exist in the world, and are not by any means always interchangeable.

In considering families that have risen into prominence from time to time, it should be remembered that in England we have three great periods of national and economic expansion—that of the thirteenth and fourteenth centuries, corresponding with the crusades and the English occupation of France, the remarkable Elizabethan outgrowth of the sixteenth century, and the great movements of the nineteenth century, the effects of which we will treat separately. It will be noticed that these epochs occur, roughly speaking, at intervals of three hundred years, the span of ten generations. Each of the periods gave an opportunity for the latent ability of the nation to come to the front—that ability which by marriages and intermarriages had accumulated in certain families and individuals during the preceding centuries. The aristocracy of race and intellect was waiting ready to declare itself as soon as the opportunity was given. In any such time of expansion, the abler families rose first, the less able followed as the road was made easier, and the way to success was paved in front of them. So it is that all good people, looking back over such a period, are apt to lament the falling off of ability, and to tell tales of the “giants” of those early days. Truly

the giants arose first, proved themselves, and, if their rise were due to commercial enterprise, as often as not withdrew from the competitive struggle for wealth, devoting themselves to other less remunerative but more honourable and important kinds of work.

To illustrate the rise of families, five consecutive titles have been taken at hazard from the Peerage and their history analysed, in some cases with the help of the *Dictionary of National Biography*. The letter chosen, "G," was taken entirely at random, and a general acquaintance with the history of the families of our titled aristocracy gives the impression that the biographies here noted are fairly typical ones.

Gage.—In 1234 William de Gauge was constable of Carmarthen Castle and received grants of land. Two consecutive marriages of his heirs in the fifteenth century with daughters of members of Parliament probably indicate the introduction of fresh blood of good stock. The son of the second of these marriages, Sir John Gage, was captain of the castle of Calais, constable of the Tower, and captain-general of the bands of horsemen. He was made a Knight of the Garter by Henry VIII., and, marrying the daughter of a brother Knight of the Garter, had for a great-grandson the gallant Sir Henry Gage, governor of Oxford under Charles I. Sir John's eldest son, Sir Edward, K.B., a man of distinction, had nine sons, whose history we cannot trace. The eldest became a member of Parliament, and, dying apparently unmarried, was succeeded by a nephew, Sir John, created a baronet in 1622. Thence through marriages with the well-known families

of D'Arcy and Penruddock, we reach the eighteenth century, and find in the records a Knight of the Bath, a Commander-in-Chief, and an Admiral of the Fleet. A Viscountcy of Ireland and a Barony of the United Kingdom were conferred in 1720 and 1780 respectively. The *Dictionary of National Biography* has records of eight members of this family.

Gainsborough.—A Robert, son of Noel, founded a priory in the reign of Henry II.; one of his sons served as sheriff of Staffordshire for seven years. In the early days of Henry VIII., James Noel was a justice of the peace. His third son, receiving grants of the lands of the dissolved monasteries, served several times as sheriff, and his grandson, Sir Andrew, was a personage of great note in the time of Queen Elizabeth, being chosen as knight of the shire in several parliaments. His heir, Edward, who distinguished himself in the Irish wars, was created a Baronet in 1611 and a Baron in 1616. Several members of the family sacrificed their lives and estates to the cause of Charles I. The dignity of Earl of Gainsborough was conferred in 1682. There are nine entries of members of this family in the *Dictionary of National Biography*, chiefly of men living in the eighteenth and nineteenth centuries.

Galloway.—This branch of the family of Stewart has an early and long record of military service in Scotland. One chieftain fell at Flodden, and of him it is recorded that he left, with one son, sixteen daughters, each of whom became the wife of a laird of distinction. Another Sir Alexander Stewart, his great-grandson, married a Douglas of Drumlanrig, and their son, also a Sir Alexander, "a man of great

talent, loyalty, and integrity," received the Earldom of Galloway in 1623. Several members of the family distinguished themselves in the army, and one, the fifth Earl, was a statesman of ability in the reign of Queen Anne. During the eighteenth and early nineteenth centuries, this family produced three admirals, one rear-admiral, one lieutenant-general with the G.C.B., and one major-general with a K.C.B.

Galway.—The family of Monckton was settled in Yorkshire in the fifteenth century, and filled many offices of importance in that county. One member did service against the Scots in 1545 ; two of his descendants served in the armies of Charles I., while the head of the family, Sir Philip Monckton, sat for some time in Parliament as member for Scarborough, and distinguished himself in actions against the Parliamentary commanders. His son, Robert, assisted in the Revolution of 1688, served in Parliament, and was Commissioner of Trade and Plantations. His son, John, was created a peer of Ireland in 1727, and occupied several responsible posts. During the eighteenth century this family produced one governor and commander-in-chief and two generals, while a daughter of the stock was the mother of the first Lord Houghton, and ancestress of the present Earl of Crewe.

Garvagh.—One Robert Canning, reputed to be of an ancient Wiltshire family, was an eminent merchant of Bristol in the fourteenth and fifteenth centuries. His son and grandson were both Mayor several times, and represented the city in Parliament. A great-grandson, William, undertook the complete restoration of St. Mary Redcliff, and of him it is said that the

“ Mayoralty had become a sort of heirloom in his family.” He lent large sums of money to Edward IV., and, by way of acknowledgment, was offered, but refused, the King’s natural daughter for a second wife. The elder brother, Sir Thomas, was Lord Mayor of London in 1456, and other direct descendants, one a “ Turkey Merchant,” occupied various honourable posts, such as ambassador to the Great Mogul, master of the Iron-mongers’ Company, etc., showing the intimate connection in those days between the trade of the country and its distant foreign affairs. George Canning married in 1697 a woman who came of able stock, the daughter of one Robert Stratford, and aunt of John, first Earl of Aldborough. Their grandson was George Canning, the Prime Minister in 1827 ; and his third son, Governor-General and afterwards Viceroy of India, was created Earl Canning. Unfortunately for the country, this distinguished statesman married a co-heiress and left no descendants. His cousin, Stratford, son of a London merchant, was a distinguished diplomatist, and was created Viscount Stratford de Redcliffe ; while yet another cousin, who was a Fellow of the Royal Society and of the Society of Antiquaries, was raised to the Peerage in 1818 as Baron Garvagh.

These five families, taken by chance, are remarkably good instances of the persistence of certain kinds of ability. The Gages and Stewarts represent a military type, continuing at a high level throughout several centuries. The Noels and Moncktons have performed their chief service to the country in the work of local administration and parliamentary office. The Cannings

are an interesting example of long-continued eminence in commerce and local municipal service. The characteristics required for the skilful carrying through of negotiations in regard to trade, and especially foreign trade, can be turned to advantage in the higher spheres of international diplomacy. This conjunction of qualities is illustrated also by the recent history of the Baring family. The records of the five families described above throw little light on the nature of the marriages, but whenever any information is conveyed as to the part probably played by the mothers, it is in accordance with what we might have anticipated from the achievements of the next generations.

The five families we have taken by chance for detailed study are but a sample of the specialized ability of different kinds to be found, latent or manifest, in the classes of our people whose ancestors in recent generations have distinguished themselves by honourable service. The list could be extended almost indefinitely, and the same phenomenon of slow, steady rise, as a characteristic of stability, traced through countless other names in the titled and untitled aristocracy.

It should be noted that for centuries a large proportion of those men who attain great eminence have been given Peerages. The state is accustomed to reward conspicuous merit by an honour which involves the duty of serving the country in Parliament. The consequent concentration of ability, administrative, legal, military, or scientific, in many of the families whose heads at one time or another have been ennobled should not be overlooked. It is certain that the House of Lords itself contains a very high percentage of men

of great ability ; in fact, a specialist in knowledge and experience of almost any kind could be found on its benches.

It is unfortunate for the purposes of this book that records of specific ability, continuing in a family throughout many centuries, are extant for one subdivision of the nation only, since the inheritance of specialized ability of other kinds is found in all classes of the community. To those familiar with the management of estates or the control of manufacturing enterprises, in which a special sort of skill is required, many instances will occur where clear evidence can be obtained that father and son have succeeded each other in one particular department for several generations. There is on record in Devon a family whose members are said to have served one particular village as blacksmiths since the reign of Elizabeth. The office of shepherd is often found to be hereditary ; the post of woodman descends occasionally in a family almost as of right. It is in just such work, involving an instinctive capacity for handling animals and divining their needs, or an intimate acquaintance with forest lore and a sensitiveness to conditions of climate and soil, that this kind of hereditary ability is most likely to become manifest. In such cases it is fortified by knowledge which has become traditional, and by environment which has provided an ideal surrounding for the development of latent aptitudes and the increase of the store of woodman's or shepherd's craft. For any one to whom the chance occurs, the piecing together of such family pedigrees would be most illuminating, and would probably throw new light on

the co-ordination and persistence of a fresh set of characteristics.

The seafaring population of Devon and the adjoining counties, and especially the families of the great west-country admirals and explorers, would also well repay careful study, and might give very suggestive facts on the respective parts played by inheritance, environment, and opportunity. The Royal Navy still draws a large proportion of its men from the south-west of England.

Turning now to the third period in which the rise of families is a marked phenomenon, we may say that the opening years of the eighteenth century found England in the full swing of the period of drinking, gambling, and hard living which is usually associated with the Restoration. Not only do the local records of the time make the prevalence of this kind of life very clear, but the number of societies founded by the upper classes for the "Reformation of Manners" in the lower orders furnish strong evidence of the extent of the movement and the alarm it caused. In plain English, the labouring classes, as well as those in higher positions, had a rollicking good time, just as they had had in the days of Queen Elizabeth, when the newly won sea-power was developing and expanding the resources of the country. The incompetent and incapable went under in the general merry-making; a vigorous, healthy animal stock remained to grow up, and attributed any success in life that they achieved to good fortune and their own merits, leaving Providence with credit only for the periods of pestilence and the lean years of a

short food supply—a most promising state of mind, we may observe, by the way, for the ministrations of the great evangelical reformers of the period, who were genuinely concerned with the state of souls in “this carnival of bestial drunkenness.” The local and ephemeral movements towards improvement became national under the influence of earnest men like Wilberforce, at that time member of Parliament for one of the divisions of Yorkshire, where the rapid growth of a new manufacturing population had brought about an obvious break-down of the primitive organization. Gradually large numbers of the people were driven by economic pressure into the newly established factories, which, as mechanical inventions multiplied, required immense supplies of labour, while the rapid enclosure of common lands disorganized the life of the country-side. The old relations between masters and workmen came to an end, and the country was brought face to face with the misery of uncertain labour, divorced from the land and its natural leaders, and constantly thrown out of place by improving machinery. The Parish authorities in the large towns used the factory districts as dumping-grounds for the children growing up under their care. They were permitted to include a small percentage of idiots or feeble-minded children in their quota of normal human supplies. Such, briefly, were some of the conditions associated with the early years of the industrial expansion of the eighteenth and nineteenth centuries; such were the circumstances that, later on, led to the long series of enactments affecting child labour and life in the factories. Two and a half centuries earlier, somewhat similar circumstances, bringing about a like

break-down of local organization, had led to the placing of the Elizabethan Poor Law on the Statute Book of England.

In the conditions of life that we have described above, certain characteristics, such as stability and sobriety of conduct, power of organization, knowledge of local conditions, combined with the possession of a moderate amount of capital, were sure to come to the front, and precisely such characteristics were supplied by the yeomen and farmers of the bleak and unsettled country of East Lancashire and West Yorkshire. Of good stock, many of them bearing honourable names, and some descended from families of distinction, they had established their homesteads and booths along the streams and up the mountain-sides. Managing their parish affairs as churchwardens and overseers, serving as "high constables" of the bare forests which were their summer pasturing ground, they had ample scope for developing their powers of organization, and the virtues of self-confidence and independent foresight. With these aptitudes, they became the natural leaders of the new trade movement. The water power was at hand running through their farm buildings; the sheep were grazing in the forest to provide the necessary material; the population was increasing on all hands to both supply labour and justify production; it was, in fact, the precise moment when we should expect to see a fresh sorting-out of the accumulated stock of ability, and the recognition of a new type of aristocracy. Let us trace from wills and other records the actual rise of one or two typical families.

Two brothers, Richard and John, living in hamlets

or booths where we find others of their name in the Hearth Tax rolls of Charles II., died in 1720 and 1724, both having served their time as "overseers." Each of them left to their numerous offspring several copyhold messuages and lands. They are described as yeomen, and divided sums of money varying from £10 to £40 apiece among their children. John apparently had four sons; the eldest and the third, another John, are described in their wills as yeomen, the other two as woollen weavers. John, the younger, dies while some of his children are still under age, and leaves his lands in trust; but from the will of his wife Alice, dying in 1771, we get an idea of the household possessions, for she disposes of a silver cup, silver teaspoons, china service, two chairs, a chest of drawers, and a best black gown. The eldest son, James, receives six messuages of land; a younger son, Peter, receives the "new sashed house" in the little village then beginning to develop into a manufacturing town. Peter, by marrying the able daughter of an able family somewhat above him in position, assures the future of his descendants. He starts or continues a successful woollen mill. This business in course of time passes into the hands of his widow and four sons, all competent people. A generation later the children of the eldest son leave the district, become absentee landlords, and go into the church and the army. One of the younger sons, probably the ablest of the family, opens branches of the business in the neighbouring city and establishes agencies on the Continent and across the Atlantic. He becomes intimate with the leaders of the principal political movements of the day, joins the Manchester

School of Economists, enters Parliament, and dies at a good age, leaving a considerable fortune and an honourable record of commercial enterprise and public service. We have travelled far from the days of his great-grandfather, the first John, who counted his flocks in the forest of Rossendale.

Another family in a somewhat different locality may be considered profitably. One John, whose forebears were farmers in the district at the close of the seventeenth century, is described as a "barber," and marries Ann, the daughter of a weaver. Their son, described indifferently as barber, chirurgeon, and linen-draper, married the capable daughter of the prosperous postmaster, thus taking the first essential step to family prosperity. He leased a farm of 700 acres, and early in the nineteenth century left a fortune of over £10,000. Again we find that the whole family were warmly attached to the then radical movement, and threw themselves vigorously into the stirring political life of the day. Three of the sons migrated to the neighbouring city and built up a large and successful business. Two of them became members of Parliament, one was knighted, grandsons occupied responsible positions in Parliament, in municipal affairs, at the head of large economic enterprises; and many of the descendants of John, the barber, and Ann, the weaver's daughter, are well-known people at this present day.

From a fairly extensive acquaintance with family records in various parts of England, these two brief abstracts appear to be representative of the rise of families in industrial circles during the eighteenth and nineteenth centuries. The sons of yeomen of good

stock are drawn into the stirring life of the period. They set up small mills along their native water-courses, the next generation puts in machinery and extends the business in all directions. The most capable section of a whole class rise slowly together, continuing to live and mate among themselves and their likes, a process which has none of the objectionable and destructive elements associated with the sudden withdrawal of an immature individual into another sphere of life. Gradually the abler families and abler individuals separate out, for a while holding up the less competent members of the stock. To the winners, generous and warm-blooded men, their success, as they reach the position held by other families of long standing, suggests that all men are born equal, and only require opportunity to demonstrate the truth of the proposition. Thus naturally they become individualists ; but in reality it is the process of the sorting-out of an aristocracy of latent commercial ability, integrity, and organizing power that has brought them to the front. They attribute their success to superior education, and found schools, churches, and mechanics' institutes, hoping, by equalizing opportunity, to equalize achievement. They overlook the innate qualities required to take advantage of each favourable opportunity of life as it presents itself, and to seek out and profit by education in the days when it was not at hand in every village school.

Then the foremen-workmen rise in their turn—men of the same blood, of slightly less ability and somewhat humbler birth ; and the foundling apprentice follows suit, for other foundlings besides Tom Jones had good

stuff in them, and, less fortunate than Tom, found their way into the workhouses, where they were systematically drafted off to the factories. In those days there was a high rate of illegitimacy, to which every section of the community contributed. Heredity laughs at the marriage ceremony, and manifests itself freely without benefit of clergy. Nowadays an able foundling is rare; the change in quality, as well as in quantity, is well marked to all who are familiar with the internal history of workhouses.

In looking back over such a period, and in considering the rise of families in the light of tradition and records, it is easy to see how the pronounced conceptions of individualism arose. After the movement was once fairly started, their enterprise, their sense of power, their need for a larger sphere of action caused the abler men to drift away from the familiar surroundings. The recollection of the old quiet home-stead faded, and the tradition of it was lost in a couple of generations. It is easier for an individual or for the branch of a family to effect an alteration in their sphere of activity after a change of locality; for the presence of and habitual contact with relatives of another position and different type of mind prevents complete fusion with a new circle in the same neighbourhood. The interests and sympathies of two divergent branches of a family will soon become discordant; feelings of irritation and disappointment are engendered, and are best and most thoroughly allayed by the action of time and distance.

Conditions of the early days of the nineteenth century made travelling difficult; a visit to the old home once in

ten or twenty years seems to have been felt sufficient ; the previous rugged circumstances of life had not permitted the accumulation of such family treasures as portraits and plate. Family affection among the present and the living was strong, as it is sure to be in 'a vigorous, healthy stock ; but family pride in ancestry disappeared with the knowledge of the ancestors. The greater wealth, increased luxury, larger responsibilities, wider outlook, seemed to justify the belief that the individual had achieved a success, for which, if foolish, he thanked himself, if wise, he thanked God ; but, in any case, usually forgot the sturdy yeoman ancestors who had lived and laboured and intermarried for generations before him.

CHAPTER VII

THE DECLINE OF FAMILIES

THE decline and fall of families is a study which follows naturally on the examination of their rise and establishment in positions of stability. Often, but by no means always, the two branches of family history can be traced together. The reasons for the one phenomenon are soon found to be as clear and distinct as the reasons for the other. First and foremost, we may say that there is more truth in that distinguished Irishman Sir Harry Boyle's description of the family of Godfrey O'Malley as one in which it was hereditary to have no children, than the Englishman hitherto has given him credit for. Sterility and comparative infertility are as definitely hereditary as other qualities, and seem in some cases to be associated with a lack of vitality and an absence of the *joie de vivre*. As an extreme instance of this state of affairs, after studying more general cases, we will follow Galton and consider at some length the effect of marriages with heiresses. Several points of interest arise in connection with marriages with unsound stock, and we may probably take as one manifestation of unsoundness extravagance and riotous living. Such marriages, it may be

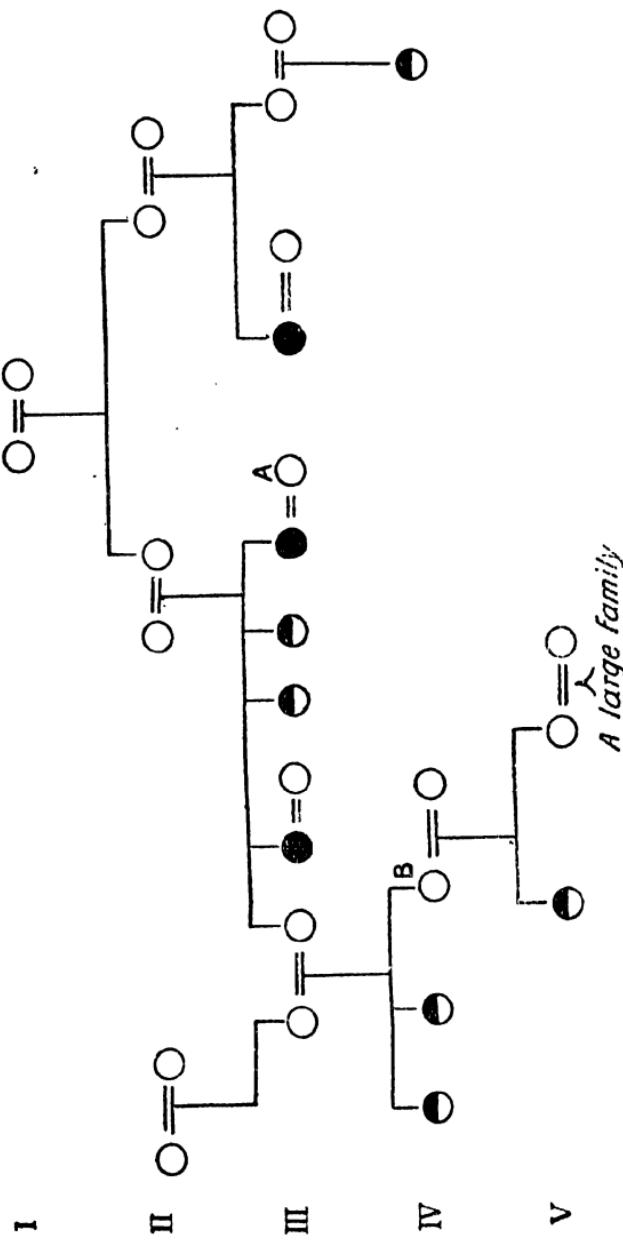
pointed out, more often destroy the quality than the quantity of the offspring, causing a decline in the status of the family ; whereas marriages with infertile stock will often bring the strain to an abrupt if honourable conclusion.

In studying pedigrees illustrating in a general way the extinction of families by the first cause mentioned above, we notice at once three apparently correlated manifestations of infertility, which are often found together in the same lines of descent. The first is the prevalence of small families, in cases where there are offspring at all ; the second is the prevalence of completely sterile marriages ; the third is the number of offspring who do not even marry. As an illustration of these three characteristics, three pedigrees are given below. It should be noted that all the marriages involved, except perhaps those of the last generations in each case, took place before the prevailing fashion of small families set in, and are consequently unaffected by it.

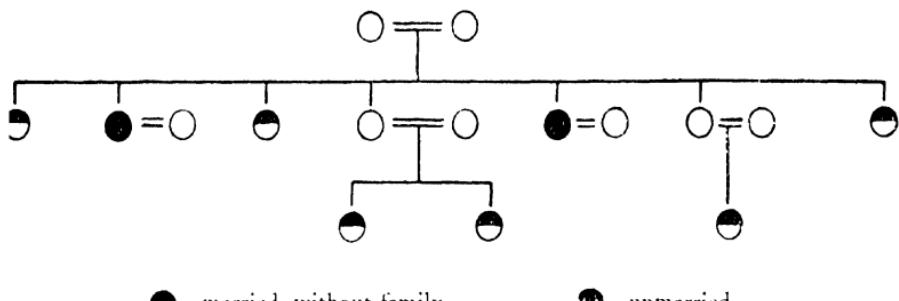
In Pedigree I. it is possible that the full history of generations I. and II. is not completely known, but it will be seen that in generation II. the three recorded marriages produced but eight children, while in generation III. five marriages resulted in four children, of whom only one married. The individual A in generation III. came of a strong, able, and fertile race, and had a large family by a late second marriage, thus emphasizing the infertility of the stock with which we are dealing as the cause of previous want of offspring.

PEDIGREE I.—*Infertility*

\bullet = married, without family.
 \circ = unmarried.



With the one marriage in generation IV. we reach the turn of the tide. The future of the two families depended on one individual B. Had that individual married into another infertile stock, it is probable that both families would have become extinct. But the stock chosen happened to be a very fertile one, and two children resulted. One of these children again married into a strong and fertile stock and had a large

PEDIGREE II.—*Infertility*

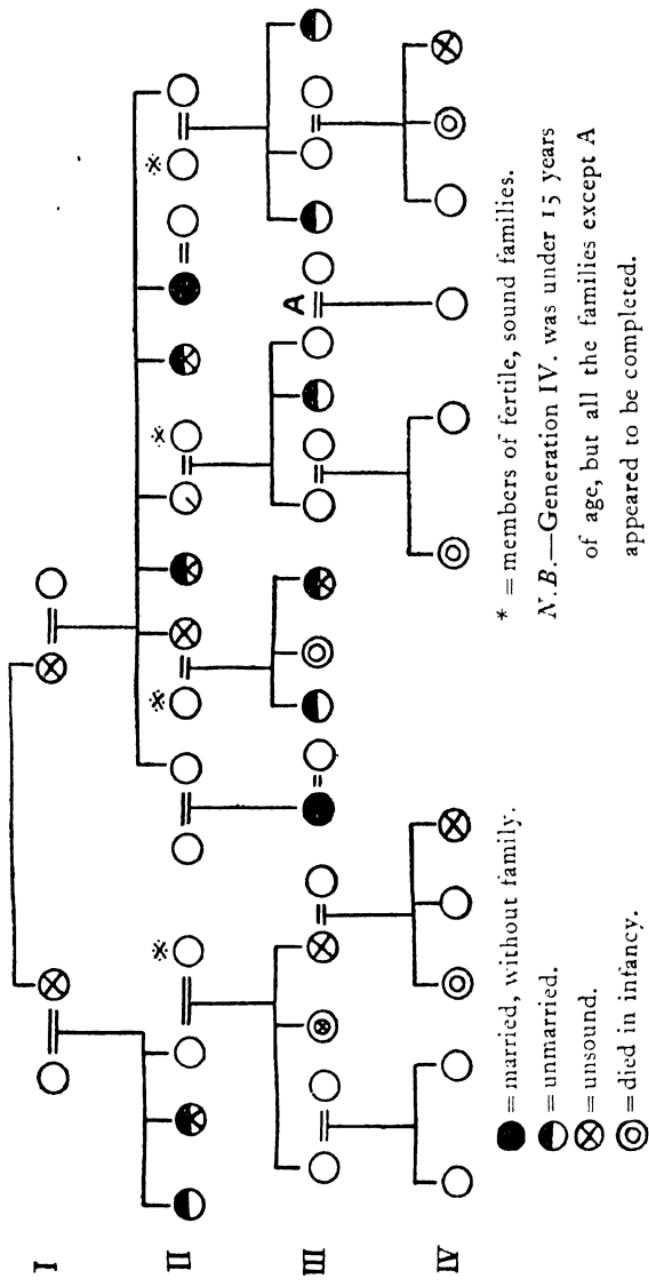
● = married, without family.

○ = unmarried.

family. Thus two alliances with fertile blood re-established the families we are considering when they were well-nigh gone.

A second family, totally unconnected in blood and locality with the previous example, shows the same phenomenon of infertility.

Here a large family of marked ability has dwindled away in two generations in precisely the same manner; we see the same evidence of correlated forms of infertility in the sterile marriages, the two small families of one and two children respectively, who in their turn did not marry, and in the three unmarried members of the original large family. There is no symptom of any

PEDIGREE III.—*Unsoundness and Infertility*

unsoundness of body or mind in either of the two pedigrees given above.

Two pedigrees will now be given to illustrate another feature of the problem before us, namely, the partial extinction and lowering of the vitality and ability of families by the introduction of an unsound strain, whether the unsoundness be of body or mind.

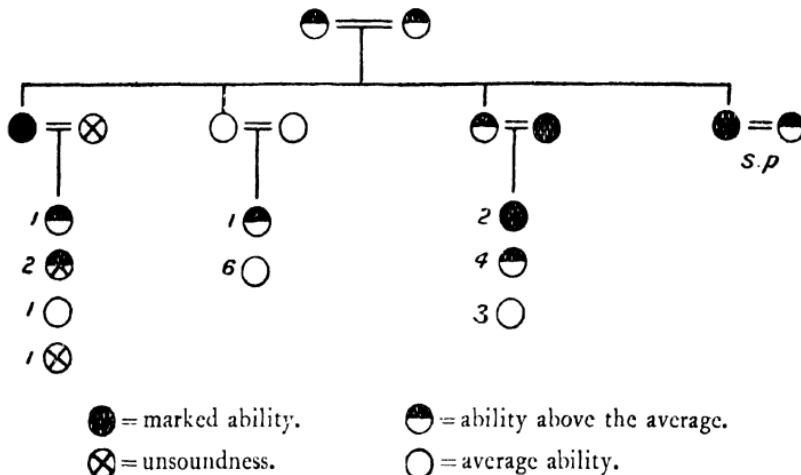
In considering Pedigree III. it must be said that the four individuals marked * each came of able, sound, and fertile stock. But the value of these three factors was almost entirely destroyed by marriage into the unfortunate family whose characteristics are under examination, in which unsoundness of body and mind are both manifested freely, the first quality taking, as one form, a high rate of infant mortality.

Another short pedigree may be studied profitably as illustrating the effect of marriages of different varieties on a fairly homogeneous, sound, able stock. Here we find that the specially marked ability of the eldest and youngest members was in one case rendered sterile, and in the other case crossed with unsoundness that seriously diminished its effective value. The interest of this pedigree would be greatly increased if either the first or fourth member had chosen as a mate a fertile individual of marked ability. It seems probable that a family of unusually high ability would have resulted from such a union. As it is, the first group lost solidarity and position owing to various peculiarities of mind and body, the second group distinctly moved downward in the social scale, while

the third group alone were able to maintain and extend their position and their influence.

For any one who is really anxious to understand the issues at stake in these problems, there is no more certain way of accomplishing that object than by carefully plotting in the symbolic form the descent of special characteristics, either in their own constituent

PEDIGREE IV.—*Variation of Ability*



families or in other families with whom they are intimately connected. The impressiveness of such pedigrees as those given above turns largely on a personal knowledge of the factors involved, of their effect on family and social life, of the intensity of their manifestation in the various cases; and one such record conscientiously compiled from notes and observation is far more instructive than the study of half a dozen records put together by other people.

One thing becomes very clear : that we are dealing with a large number of separate factors—various types of ability, various degrees of unsoundness of body and mind, various qualities of temper and character. Longevity, proneness to certain diseases, height, colour of hair and eyes, all may be tabulated as separate entities, and their combinations, separations, and re-combinations watched throughout succeeding generations.

As we said in the beginning of this chapter, a study of the effects of marriages with heiresses is a study of a specialized form of infertility, interesting chiefly on account of its social and economic bearings, important because of the frequency with which such marriages occur, disastrous because the type of man who marries an heiress is usually one who has something to offer, ability or good breeding, in exchange for the fortune which sometimes accompanies the heiress and causes her to be considered a desirable wife.

The whole subject has been admirably set out and treated by Galton in his book on *Hereditary Genius* under the title of "English Peerages, their Influence upon Race." To this work the reader who desires further details or wishes fully to grasp the bearings of the problem is referred.

We have already produced evidence to show that infertility in its various manifestations is hereditary in the same way as other mental and physical attributes. We should therefore expect that a woman who is either the sole issue of a marriage or one of two or three children would prove infertile herself or produce

a limited number of offspring, who in their turn would be likely to prove infertile.

Galton brought evidence to show that the judges, as a whole, were a prolific stock. He then made a study of the judges who received peerages and who last sat on the Bench previous to the close of the reign of George IV. Thirty-one peerages were conferred, nineteen remain unto this present, and twelve are extinct. On analysing the marriages of these Law Lords and their descendants, the following results were obtained :—

(1) Out of thirty-one peerages, in seventeen cases marriage with an heiress or co-heiress was followed by sterility, sometimes in several instances in the same family.

(2) The direct male line of eight peerages, viz. Colpepper, Harcourt, Northington, Clarendon, Jeffreys, Raymond, Trevor, and Rosslyn, was extinguished after alliances with heiresses, and six others had very narrow escapes.

Of the four extinct law peerages that are unaccounted for, two peers—Somers and Thurlow—died unmarried, and two only remain whose failure cannot be accounted for by marriage with heiresses.

The same class of result is obtained if the statesmen of George III. and the premiers since 1760 down to recent times be made the subject of a similar inquiry. Twenty-two such men were considered. Fourteen have left no male descendants, and in seven of these cases the original peers or their sons married heiresses, viz. Canning, Lord Castlereagh, Lord Grenville, George Grenville, Lord Holland, Lord Stowell, and Walpole (first Earl of Orford).

Among 200 wives of peers, Galton found that 100 heiresses produced 208 sons and 206 daughters, or 414 children in all, while 100 who were not heiresses had 336 sons and 284 daughters, a total of 620. One-fifth of the heiresses had no male children, showing how precarious must be a line of descent through heiresses. From such results as these it seems clear that the extinction of many aristocratic families, and the failure of many eminent men to leave offspring behind them, are due, not to infertility in themselves, but to the overwhelming temptation to marry heiresses in order to endow with worldly goods the position and dignity in life to which the families have attained by sheer ability. Obviously, then, from the point of view of the continued efficiency of the nation, the only sound way of rewarding great services is the old plan of combining a hereditary title, if such be the acceptable and customary offering, with a grant of "lands of inheritance" or a substantial sum of money, that will do away with the temptation of marrying heiresses for the sake of their worldly substance.

For the most part, families who have risen in the world have been negligent in the matter of keeping together their family history. In families who have declined, though bare pedigrees are more often available, there is usually on record but little information about the characters of the individuals who contributed to the fall. The volumes of Burke's *Vicissitudes of Families* are tantalizing, both in their suggestiveness and lack of detail. The characters and even the names of the mothers are usually lacking. Nevertheless, it is possible in several cases to piece together

sufficient evidence to throw some light on the problem before us.

The account given of the family of Elwes is one of the fullest and also one of the most interesting, since a singular combination of qualities, those of miser and spendthrift, ran side by side in it. The story begins with Sir Gervase Elwes, spendthrift and roysterer, created a baronet by Charles II. Of his children and their marriages there is no account. The title and the scanty remains of an encumbered entailed estate passed to a grandson Hervey, who, consumptive in youth, remained unmarried, lived a solitary life, accumulated a vast fortune, and was known as Elwes the miser. His money passed to his sister's child, who took the name of Elwes, the barren title going elsewhere. The sister, obviously a miser by inheritance, was married to a prosperous brewer, son of Sir George Meggott, M.P. At her husband's death, which occurred when her son John was four, she received one hundred thousand pounds, in spite of which, says Burke, "true to the failing of her race," she literally starved herself to death. This son John is the most interesting character in the family history. Although dissipated, he was economical in small matters, two characteristics inherited from his mother's family. In later life he became as apt a miser as his uncle, living with one or two servants in whichever of his numerous large houses happened to be short of a tenant. He was a good and upright magistrate, an able man of business, thrice member of Parliament, and, in times when elections were expensive luxuries, could boast of having got his seat at an outlay of eighteenpence—in certain of these matters inheriting

from his father's side. He left half a million of money between two illegitimate sons, with whom our history of this branch of the Elwes ends.

The title meanwhile had gone to a great-grandson of the first Sir Gervase. There were successively two families of sons, who, brought up in scant comfort, served in the army. The eldest of the second generation, Sir William, was the typical dissipated spend-thrift. He married a lady of good family whom he deserted. She died in a lunatic asylum, while he himself spent much of his later life in debtors' gaols. Their son, an honest fellow who accepted his position, was at one time boots and head waiter at a country inn ; he married a respectable woman in his own rank of life and had a large family of children. In the middle of the nineteenth century, these children held positions as clerks, drapers' apprentices, etc. The title appears to have fallen into abeyance or disuse.

When one first considers such records as those given in this chapter and the preceding one, a feeling of despair is apt to arise at the inevitableness of the succession of good or evil. It seems of little use to fight against fate. But in reality, for most people, there is no cause for such despondence. As usual, a knowledge of the natural laws governing a subject leads to greater freedom, if also to increased responsibility. We learn the exact limits of our liberty, the precise nature of our fetters. We know partially the extent to which we are masters of fate when we realize the probable character of the abilities that are latent within us. Certainly, in problems connected with the education

and choice of professions for children, nothing can be more helpful than to have some idea of the directions in which they are likely to succeed, the duties and responsibilities that probably may be best undertaken by them. Similarly the time-honoured petition "lead us not into temptation" gains new force and meaning if we understand the nature of the temptations which are likely most to affect us. It becomes also much more possible to remove danger from each person, or to warn and fortify him against forms of evil which have already proved fatal to others of the same stock. By the study of heredity, we may gain an insight into the qualities that are entrusted to each individual to develop for the advantage of himself, his family, and the community, and learn to recognize the various failings specially to be watched and guarded against. The whole subject is fraught at once with the greatest spiritual dignity and the utmost social importance.

CHAPTER VIII

THE BIRTH-RATE

THE general result of the investigations followed in this book cannot be mistaken. All the evidence we have considered emphasizes the supreme importance of heredity in determining the character of a race, and the direction and rate in which that character changes.

Our population is made up of elements of very different nature. As we have seen, the ability of some men must be reckoned as a hundred times the average. Physical powers probably vary less ; but other mental and moral characters show divergences as great as those found in estimating ability.

All characters, mental or physical, tend to be inherited ; and, if one element of the people reproduces itself faster than the rest, it will soon exert a dominant influence on the average character of the whole. Its peculiarities become the normal characteristics of the nation.

The speed with which any specially fertile stock increases proportionally to the rest of the community does not seem to be generally understood. A few figures may serve to make it plain.

In order that a population should maintain its

numbers unaltered, about four children must be born to each marriage that produces children at all. Of these four, on the average of large numbers, two will either die early or have no children, and the other two will be left to continue the race in place of their parents. Such is the result of the Registrar-General's returns.

We shall see later that certain large classes of the people now produce an average of only three children to each fertile marriage ; that is, only three-quarters of the births necessary to maintain their numbers unaltered. If their death-rate be taken at 15 in 1000, their birth-rate must be about $\frac{3}{4}$ of 15, or rather more than 11 ; that is, about 4 less than the 15 needed to replace the deaths. At the end of a year, there will be about 996 instead of each 1000 persons alive at the beginning of the year. At the end of a century—three short human generations—each 1000 persons will be represented by only 687, and in two hundred years by 472.

The birth-rate of other sections of our people is still some 33 per 1000, or 13 more than are needed to balance their higher death-rate of about 20. At the end of one year, each 1000 will have become 1013 ; at the end of a century, about 3600 ; and in two hundred years, about 13,000.

The less prolific stock, if originally equal in number to the other, would be but about 1 in 6 at the end of a century, while in two hundred years it would form but about 1 in 30 of the population. It would be lost in the descendants of the stocks of predominant fertility.

Such figures are given only as examples of the kind of results to be expected. Nevertheless they enable us to appreciate the rapid effect of natural selection on the average character of the race. Let one section of the community establish a faster rate of reproduction than others, and quickly, with ever-increasing speed, it grows relatively, and eventually dominates the whole.

In past ages, in general, selection has probably worked well. The stronger, abler stocks had more offspring, and a better chance of rearing them. The weaker, unsound strains were kept down, and their bad qualities tended to be bred out of the race. The rapidity and efficiency of such a process is shown by the calculation just given. As long as all sections of the community bred at their normal rate, nature, unaided, looked after the quality of the stock by the severity of her treatment.

But the same figures, which show the speed of disappearance by natural selection of bad qualities, make clear the disastrous consequences which must attend any artificial selection favouring the reproduction of the undesirable elements of our people, relatively to that of the good elements. If we find the birth-rate of the better and more successful families in all sections of the community falling seriously below that of the worse and less successful families, our calculation shows that bad hereditary qualities will rapidly spread throughout the country. A study of the general birth-rate is useless from this point of view; the all-important questions to ask are, "From what sections of the people are we recruiting the nation?" "Who are the parents of the next generation?" It is desirable, no doubt, to

fit able men into positions of influence and responsibility, in government, profession, or business. But it is of far more importance in the long run to secure able, trustworthy, healthy men and women as the progenitors of the generations to come. Their qualities will be inherited, and permeate the nation the more rapidly the higher is their relative rate of reproduction.

Till about the year 1875 no artificial selection seems to have arisen. Heron has shown that, in 1851 in the well-to-do parts of London, the rather higher average age at marriage was enough to explain the slightly smaller birth-rate. Early marriages swell the birth-rate in two ways. They increase the average number of children born to each couple, and they diminish the average interval between succeeding generations. But, till recently, the much higher death-rate in the poorer districts more than compensated for the slightly higher birth-rate. Large families were the rule in all sections of the community, and natural as well as economic causes tended to favour the better stocks. Since 1875 a serious change has arisen. In the generation now growing up, large families are rare in the upper classes of the community and among the higher ranks of the skilled artisans; but they are still usual in the thriftless ranks of unskilled labour and among the feeble-minded men and women still at large in our midst. Only one generation has yet suffered, and the results are only now appearing. Perhaps there is still time for repentance and safety. But the calculation of the numerical effect of a selective birth-rate, with which we began this chapter, shows that no time is to be lost. If present tendencies are unchecked, the quality of the

race must deteriorate with ever-increasing rapidity, till it approaches that of the lowest types among us. Let us investigate the facts with no panic alarm, but with no self-complacent blindness to sinister indications.

All the subjects that we have hitherto investigated lead naturally to a consideration of the actual birth-rate. The inheritance of ability or of feeble-mindedness, the circumstances bringing about a rise or fall in the social scale of certain families, are subjects which some people may think right to put aside, as matters either of purely scientific interest or of recondite genealogical research. But the number and kind of people born into a nation, whether they are likely to be a help or a hindrance to the community, to need fewer schools or more lunatic asylums, to require supporting or to support others, to be able to defend themselves or to offer themselves and others an easy prey to any attack,—all these are points of vital importance to every sane person, and are brought home to him in a practical manner every time the rate collector calls at the door, the Income Tax Commissioners deliver their demand, or the cook gives notice and cannot be replaced.

Now a study of the birth-rate of all Western civilized nations has one immediate effect—the compulsory realization of dwindling values throughout. Corrected for whatever other causes the statistician can bring to bear, increased longevity in especial, the one fact remains perfectly clear. In proportion to the population, whether we consider France, Belgium, England, Germany, rural districts alike with urban areas, the number of children

born to each thousand of the population is steadily decreasing, and, in France, at any rate, in one year actually has been less than the number of deaths—"more coffins than cradles," as a German observer aptly remarked. For the first three nations, the turn of the tide occurred uniformly between 1873 and 1876; in Germany the ebb set in about fifteen to twenty years later. In Ireland alone of the constituent nations of the United Kingdom, the drop was checked about 1890. For the rest of the United Kingdom the number of births *per annum* has fallen from 36 in 1000 in 1876 to 27 in 1000 in 1907.¹

We could, perhaps, afford to regard such a state of affairs with equanimity could we remain under the delusion that the population of the British Isles was homogeneous throughout; that the previous thousand years of stress and strain had produced no sorting-out of ability, no "survival of the fittest," and that ability was a matter of chance or the creation of the school-master and drill-sergeant. If the condition of affairs had remained the same in 1901 as in 1871, the Registrar-General would have had to record about 200,000 more births in 1901 than he did; and, by the curious perversion of desire that often accompanies human affairs, whereas in 1871 we were inclined to be dissatisfied with the large size of his returns, in 1901, and ever since, we have become alarmed at their decrease.

The general opinion on the subject of population and subsistence has varied greatly from time to time.

• ¹ *Public Health and Social Conditions*, Blue-book published by the Local Government Board, 1909.

In the days of national stress during the Seven Years' War, Pitt desired an increase of the people, and reckoned as a benefactor to his country a man who brought up a large family. In 1798 Malthus, misled by a partial knowledge of the problem, proclaimed that human population always tended to outrun its means of subsistence. It could only be kept within bounds by famine, pestilence, and war, whereby the redundant individuals were eliminated. In later editions of his book, it is true, Malthus recognised the importance of the prudential check of postponement of marriage, and the extension of knowledge which followed the institution of the census in 1801 soon showed how effective this check was in adjusting population to the existing economic demand.

But Malthus made a more serious mistake in believing that, while population tended to increase in a geometrical progression in the ratio of the numbers 1, 2, 4, 8 . . . , subsistence could only grow in the arithmetical series 1, 2, 3, 4 It is certain that during the past century, wealth and the means of existence have increased in England faster even than the population, which itself has grown to an extent that would have seemed impossible to Malthus. While the natural produce of the earth, which could be used by savage men, increases slowly, a second term is involved in the total amount of subsistence—the produce of civilized industry, which grows, other things being equal, in proportion to the number of competent, civilized men. But other things are not equal. A comparatively dense population is more effective in modern industry than one more scattered;

less waste occurs in communication, transport, and the distribution of power ; more improvements in industry are made, owing to the closer contact of minds working at the same problem. Hence, with two populations of the same quality, a dense one is more efficient than a scattered one, and the second term in the total means of subsistence grows faster, sometimes much faster, than the population.

But the real heart of the problem is to be sought in the *quality* of the population. Were the whole people of England suddenly to become feeble-minded, or even to be changed into unintelligent, casual labourers, the existing means of subsistence would rapidly become useless or be destroyed, and famine and pestilence would quickly reduce the population to the few who could snatch a living from the wreck of our civilization.

So, on the other hand, could the average strength and ability of the nation be increased, the wealth of the country would grow far quicker than any population possible at present could outrun. As William Farr, one of the ablest of our statisticians, wrote in the Census Report of 1851 :—¹

“The character of every race of men is the real limit to its numbers in the world, if allowance be made for accidents of position and time.

“Population is often out of the place where it is wanted, or could be most productive ; but the population of the world is not, as Malthus assumes, redundant ; and not only is there a paucity of men of transcendent genius in all countries, but few persons who have occasion to undertake, or who accomplish great

¹ *Vital Statistics*, London, 1885, p. 15.

industrial, political, warlike, or other operations, ever find that the men of skill, industry, and entire trustworthiness—of whom they can dispose, either in the highest or the lowest departments—are superabundant. Every master knows that good men—and every man that good masters—are scarce.

“The idle who will not work, the unskilful who cannot work, and the criminal classes who cannot be trusted, are, however, it may be admitted, whether numerous or few, always redundant.”

When, from time to time, the trade of the country does not show the elasticity to which we have become accustomed, and the national wealth does not grow fast enough to satisfy those in a hurry to be rich; when from one side politicians proclaim that the lesser income of the incompetent should be raised at the expense of those by whose superior ability they are virtually supported, and from the other that wealth can be increased by erecting tariff walls to check its free circulation, it would be well for the leaders who are responsible for manipulating public opinion to study the innate composition of the people, and the relative rate of reproduction in all ranks of life of the able classes, who alone are of much economic value in the community.

Doubtless, the incidence of taxation can hamper to a greater or less extent the growth of wealth and affect its distribution. But the essential factor in the rise and fall of nations is the quality of their people. If politicians and economists be dissatisfied with the relative growth of British trade, or with the relative position of the country among the nations of the world,

let them turn first to the sociologist and ask, How quickly have the different strains which make up our people been reproducing themselves relatively to each other? What is the average character of the generation on whom the work of the country now rests? What of the future generations now in childhood or yet unborn?

Nowadays, the opinion is freely and often expressed that German trade is growing at a rate which threatens the predominant position so long held by British commerce. The idea that increasing wealth in a nation with which we interchange many commodities is other than an advantage to the business of this country need not be answered here. Nor need we stop to point out the familiar arithmetical fact that, on comparatively small totals, a moderate absolute increase bulks large when expressed as a percentage.

But, while it is clear that much ignorant or interested exaggeration is prevalent about the trade returns, the fact remains that Germany has shown a power of development, industrial and military, a faculty for organization and a sense of national confidence, which must awake admiration in all beholders.

That she has been able to take advantage of the opportunities of the past twenty years is, we believe, ultimately owing to the fact that her birth-rate did not begin to fall systematically till twenty years later than that of Great Britain, and even now has only sunk to the comparatively high figure of 33 per thousand, as against our 26 per thousand. Thus in Germany restriction of parentage has not yet affected appreciably the composition of adult life, and even if, as in our case, it is found chiefly among the better stocks, it has

not yet destroyed the old predominance of the stronger and more intellectual sections of the nation.

It seems as if the real meaning of the drama of civilization, for which the world constitutes the stage, is the slow development of increasing numbers of the highest types of mankind. Not only in the pages of history, but also in the study of existing tribes and races, we can trace the process in the gradual evolution of finer and finer physical, intellectual, and moral qualities. In the familiar words, there comes "first that which is natural, afterwards that which is spiritual." For the full benefit of the action of mind upon mind, as we have seen, density of population is an important feature; and density of population only becomes a danger when its necessary safeguards are ignored by the unintelligent, the inactive, the unwilling. In the long unconscious ages of human development, natural selection takes charge of the process. But now, having eaten of the tree of knowledge, mankind, willingly or unwillingly, must assume the tremendous responsibility of moulding its own destiny. If we allow selection to cease, or, still worse, to move us in the wrong direction, if the worst strains establish a preponderant fertility and the race breeds to its lowest types, though the previous accumulation of knowledge and material wealth for a time may support the nation, degeneration is inevitable. The population will cease to be able to support its own numbers, de-civilization will set in, and nothing but a new process of selection, stern and unbending, can stop the decay or arrest the downfall.

It is perhaps arguable that a demand for certain forms of socialism, for the organization of all industry

by the State, and the assumption of public responsibility for the support of all workers, is a sign of a decadent population. If the competent have become too few and the incompetent too many, the incompetent cease to be able to obtain a living, and the resulting misery and distress make it necessary to provide for them. Heredity shows that they cannot help being less able, but, at the same time, points out to us the danger of giving them the privileges and responsibilities of ability. Society may be morally obliged to support them, but equally surely it has a duty to posterity to see that they do not reproduce unlimited numbers of incompetent offspring to be an increasing burden on the better part of the community, and eventually to destroy the civilization to a mistake of which they owe their existence.

Let us now return to the consideration of the growth of population in the British Isles. Pitt, one of our greatest statesmen, called for an increase in the people. He got it. During the ensuing fifty years, Malthus and his school of economists cried out for some power to arrest "this devastating torrent of children." The flood has been stayed. And still we are not satisfied. We are coming to understand that it is the quality rather than the quantity of population that is important. Let us see how far it is possible to conduct any inquiry into the sort of citizens that are not being born.

As stated above, in order that a nation should maintain its numbers unaltered, an average of about four children must be born to each marriage which produces children at all. If we subtract those who will not

reach maturity, those who will not marry, and those who, although married, will have no children, on the average, out of a number of such families, two children in each, equal to the number of the parents, will be left to continue the race.

What is true of the nation as a whole is true of any section of it. Four children to each fertile marriage is the least that will enable any particular stock to maintain itself relatively to its surroundings, provided they also remain at a constant level. Less than four children means the slow and certain breeding out of existence of that particular strain, with its potentialities of good and evil ; families of more than four are responsible for a gradual increase of their especial characteristics. The average character of the race is but the average character of the individuals which compose it. By an analysis of the birth-rate for different sections of the community, we can discover whether the nation be recruiting itself from its better or from its worse stocks.

Here it is necessary to make an assumption. In order to have some guide in our investigations, some touchstone wherewith to test our material, we shall consider that success in life indicates ability, and that ability is a desirable possession for a race. Either of these two propositions may be controverted. We may say with every truth that success in life depends also on character, health, power of personality (whatever that means), and that ability may show itself in the shape of a keen understanding of the weaknesses and vices of the human race, and success result from playing on the one and pandering to the other. But good health and character count with ability among the

honourable assets of a nation, while the ability which encourages a low standard of life and thought, though it does untold harm through the workings of environment, is usually too rare, too selfish, and too self-seeking to do great harm nowadays through the action of heredity.

We have said already that the decrease in the birth-rate shows itself equally in urban and rural districts.¹ It is true that between 1881 and 1901 the corrected birth-rate of the towns of Northampton, Burnley, and Halifax fell off by 32 per cent, but the birth-rates of the agricultural counties of Cornwall and Rutland dropped by 29 and 28 per cent respectively. As there is much less decline in Liverpool and Manchester, Salford and Glasgow—cities, be it noted, with a large Roman Catholic population—than in Brighton, Westmoreland, or Devonshire, we cannot attribute the falling off to “urbanization.” But it is very significant that the decline is greatest in those towns where the married women are habitually employed in the factories, and where their earnings are an important element in the weekly income of the family. On the other hand, says the Local Government Board, “the majority of mining districts form a striking contrast with other industrial districts, the birth-rate in the former being frequently considerably in excess of that obtaining in either ordinary towns or rural districts.” In the Rhondda district, a centre of the Welsh mining industry, the birth-rate in 1909 still stands at 40.9 per thousand; at Middlesborough and Tynemouth its value is 35.5,

¹ Some of the figures in this and the succeeding paragraphs are taken from the *Decline of the Birth-Rate*, by Sidney Webb, Fabian Tract, No. 131, London, 1907

while in the town of Hastings and the county of Sussex, two essentially "residential" neighbourhoods, the birth-rate is 15.9 and 20.5 respectively. In the mining areas the men are well paid, and there is usually no industrial work to tempt the women from their home duties. At the same time, it must be noted that there is a very high rate of infant mortality.

As an indication of relative wealth and prosperity, let us take the percentage of domestic servants in the population.¹ The corrected birth-rate of Bethnal Green—the district of London where fewest servants are to be found—fell off by 12 per cent between 1881 and 1901; that of Hampstead, where many domestic servants are kept, fell off by 36 per cent, exactly three times the amount. Clearly neither poverty nor employment of women in factories can be called in here to account for the alteration.

For purposes of comparison, the birth-rates of the districts of London were tabulated in grades of average poverty. The three "rich" boroughs of Hampstead, Kensington, and Paddington have a birth-rate of about 20 per thousand, the nineteen intermediate boroughs, of about 24 per thousand, while the poorest group of seven boroughs gives 30 per thousand. Truly the lean kine are eating up the fat kine! When it is remembered that many of the poorer classes live even in Hampstead, Kensington, and Paddington, it will be seen that the average difference between the birth-rate of the richer and poorer classes is probably much greater than the figures indicate. It must be observed

¹ Heron, "On the Relation of Fertility in Men to Social Status," *Draper's Memoirs*, London, 1906.

that the "poor" boroughs contain not only the highest number of Irish Roman Catholics, but also the largest proportion of foreigners and Jews. In Whitechapel and Mile End Old Town half the marriages are solemnized according to the Jewish rite.

With reference to this division of London into districts, the Poor Law Commissioners of 1909, in dealing with the question of workhouse children, have a very interesting footnote. They say : "Even illegitimacy is no proof of inferiority of stock. In visiting Poor Law institutions it has been noted that, whilst in some districts the illegitimates seemed mostly the backward and badly formed children, those in Hampstead, Kensington, and Chelsea were often the most refined, well-built, and promising." This gives us much evidence as to the class of persons who are contributing to this particular source of the population in these areas, and leaves us to infer the grave loss to the community in the substitution of an occasional chance birth, with ability probably on one side only, for the family that might be expected to result from normal married life.

We will now leave the general corrected birth-rate returns, and follow Mr. Sidney Webb in an examination of the evidence supplied with regard to a special sample of the population, selected solely on the desirable characteristics of permanent employment, thrift, and foresight. The Hearts of Oak Friendly Society has a membership of over a quarter of a million persons of the artisan and skilled mechanic classes, forming an upper class of skilled labour, in receipt of twenty-four shillings a week apiece or over. It provides a "lying-in

benefit" of thirty shillings for each birth of a child to its members. From 1866 to 1880 the claims under this head rose from 2176 to 2472 per 10,000; from 1881 to 1904 they fell from 2472 to 1165—a decline of more than half, or three times as great a fall as that shown by the total returns for England and Wales in the same period. A smaller Friendly Society gave a decline of 56 per cent. If the prosperous artisan members of these two Societies alone had maintained their rate of reproduction in 1904 as in 1880, nearly 70,000 children would have been born to them instead of 32,000. Thus in one small section of the people there is a loss in one year of nearly 38,000 children, who in all human probability would have been useful and active citizens. Other Friendly Societies show the same phenomenon.

It is possible to make a detailed study of the decline of the birth-rate of the community in various sections, which, by reason of ability of various sorts, have attained to positions of distinction and responsibility, and are included in the various biographical handbooks and works of reference. Such families possess a large proportion of the selected and inherited capacity of the country, and the environment provided by their home traditions should be of great value in making their latent ability available for national and social purposes.

Let us first consider the class of persons represented by the stable landed and aristocratic families described in any complete *Peerage and Baronetage*. A hundred fertile marriages for each decade from 1831 to 1890 have been taken consecutively from those families who

have held their title to nobility for at least two preceding generations, thus excluding the more modern commercial middle-class element in the present Peerage, which can be better dealt with elsewhere. We then get the full effect of hereditary stability and a secure position, and do away with any disturbing influence that might occur from a sudden rise to prosperity. The results obtained are probably representative also of the families of the landed aristocracy to whom a title has not fallen. For the first ten years, marriages taking place between 1831 and 1840 gave an average of 7.1 births to each fertile couple ; from 1841 to 1860 the average for each decade remained constant at about 6.1 ; from 1871 to 1880 there were 4.36 births to each marriage ; from 1881 to 1890, 3.13 births are recorded ; and it seems probable that the next decade would show another decrease, but it is impossible at present to obtain figures of much value, as one cannot be sure that the births have really ceased. Thus during the past fifty years, our stable upper classes in this section of the community have reduced their birth-rate by more than one-half, and have passed well below the point at which the number of births compensates for the number of deaths. Their virtual extinction on these lines is clearly only a matter of a few generations.

Another more varied section of the community can be studied in *Who's Who*, a book of reference which contains biographical details of some 20,000 men and women, who have reached a certain degree of prominence, and may be taken as representative of the upper official, professional, and commercial classes. Among the details furnished, the date of marriage and

the number of children frequently occur ; but, as it is impossible to be sure, in cases where no children are mentioned, whether no children have been born or whether the entry has not been made, it is necessary once more to restrict the results to fertile marriages only.

The marriages of inhabitants of the British Isles were classified in two groups, those solemnized before 1870 and those after, with the omission in each case of individuals of the class already considered above. Two subdivisions were also made, for it became apparent after a short study that clerical and military families could be more profitably considered separately.

Taking the available entries consecutively, it was found that 143 fertile marriages of laymen before 1870 had resulted in 743 children, an average of 5.2 to each couple. After 1870 the average is 3.08, or 1264 children to 410 couples. It will be noticed that these figures are appreciably lower than those deduced from a study of the Peerage, but it must be remembered that, in the first case, we have a record of all, or nearly all, the births that occur ; while in *Who's Who* the entries probably refer to such children only as are alive at the time the entry is made, and the death of at least one child in a family in the additional period of twenty years between 1870 and 1890 is to be expected.

In clerical families we find that, before 1870, there were 463 births to 93 marriages, an average of 4.99 children to each marriage, and after 1870, 437 children to 104 marriages, an average of 4.2. From the dates of marriage and preferment supplied, it is clear that the children were born chiefly before their fathers attained

distinction ; hence it is fair to assume that these figures are representative of the clergy as a whole.

Taking marriages of men who have served in the regular army and have attained to the rank of captain at least, we find for the first period that 40 marriages produced 107 sons and 92 daughters, a total of 199 children, giving an average of 4.98, the same as that obtained for clerical families, and probably equivalent to the 6 actually born given by a study of the Peerage. For the second period, 100 marriages resulted in 103 sons and 104 daughters, a total of 207 children, giving an average of 2.07. After such figures as these, there is little cause for wonder that the Army finds difficulty in keeping up its establishment of officers.

It has been possible also to include in our present survey that group of men of specialized ability who are to be found occupying the permanent posts in the University of Cambridge. The professors, tutors, deans, bursars, and such-like men in the University and Colleges are selected for what may be termed their academic distinction, almost more than for their power as teachers, and are drawn from all sections of the community. As a class they possess intellectual ability of much more than the average amount. In 1909 there were 67 men apparently in a position to maintain a family who remained unmarried ; there were 40 childless couples, who had been married for periods of five years or longer, while 70 married couples, whose youngest child was over ten years of age, had produced 199 children. This gives a total of 287 adults to 199 children, a decrease in one generation of about a third ; and, in accordance with the usual estimate, only about half

these children will become parents in their turn. Doubtless, the number of unmarried men is still affected by the rule of celibacy aforetime imposed on Fellows of Colleges. The large proportion of childless couples may indicate that men and women of academic distinction and mode of life are often not fertile and are inclined to late marriages ; while the average number (2.84) of children to a marriage which produces any offspring is closely concordant with that in other sections of the educated classes, and is probably determined by the same causes. Nor do recent marriages show any signs of improved results, since 67 marriages, where the youngest child is under ten years, and consequently may not be the last of the family, have resulted in only 164 children, an average of about 2.45. It is impossible as yet to calculate the precise rate of decline of this later group, since no estimate can be made either of recent infertile marriages or of confirmed celibates. It must be admitted that the domestic arrangements of the Colleges are openly and curiously symbolic of their deadly effect on the constituent population, since, although funerals in College chapels are of frequent occurrence, none of these buildings is licensed for marriages, nor do any of them possess a baptismal font.

In the course of the investigations of which the results are given in the previous paragraphs, it was observed that no diminution in the birth-rate appeared to occur in families where distinct evidence—either from the places of education or profession—could be obtained that the persons in question belonged to the Roman Catholic religion. It was not easy to get clear

evidence in many cases, but 30 undoubted instances of marriages between members of Roman Catholic families from 1871 to 1890 were tabulated, chiefly from *Who's Who* and the *Landed Gentry*, and resulted in a total of 197 children, or 6.6 children to each fertile marriage.

Another small section of the population was also brought within the scope of this inquiry. It differed from the previous sections in that women, not men, were the subject of the investigation. The Women's Colleges have now been established at Oxford and Cambridge for over thirty years. They attract women who possess a very definite form of ability, corresponding in many respects to that present in the men who, having come to either University, often with entrance scholarships, become masters in schools or remain in the University as lecturers and professors, and, as such, have been dealt with in the previous investigations. From the reports issued by two of the Women's Colleges, we have lists of all the students who have been in residence for one year and upwards, the degrees they have taken, and the names of those who have afterwards married. Excluding those who have left college within three years or less, we find that out of some three thousand women who took advantage of a University education, only about 22 per cent have subsequently married. There is unfortunately no record of the number of children born to each marriage, but it is undoubtedly very small. It is interesting to observe that the proportion of marriages is distinctly higher among those students who do not take the final examinations, or, taking the examination, fail to obtain honours. If the

marriages be tabulated according to the subjects studied, mathematics gives a markedly lower average than any other.

From the point of view of the sociologist, the importance of this branch of our inquiry lies in the question of which is the cause and which the effect. If these figures indicate that certain women, early realising their unfitness for the primary duties of motherhood and family life, decide to take up and devote themselves to another career, usually the teaching profession in secondary schools, in which they are more likely to succeed, the result need not give rise to surprise or anxiety. But if these figures mean that exceptionally capable women, attracted by the intellectual life of the Universities, are thereby rendered unfit or unwilling to discharge their natural functions, the whole matter requires very serious reconsideration. From what has been said in the chapters on the inheritance of ability and the rise of families, it is evident that, for the sake of future generations, the ability of the mothers is at least of as much importance as that of the fathers. It must be remembered that the movement in favour of the higher education of women on the same lines as that of men, and their utilization in many spheres of employment, is a recent movement, and is growing rapidly in all Western communities. The problem of "cause or effect" is therefore of the gravest import. It is a well-known fact that the decline of the birth-rate among married women teaching in the elementary schools is very great, though no statistics can be given. We have now clear evidence that the marriage-rate among those who are capable of teaching in secondary

schools, or of undertaking original research work in history, literature, or science, is very far below the average rate for the classes to which they belong ; and it is practically certain that the birth-rate is correspondingly low also.

CHAPTER IX

THE SELECTIVE BIRTH-RATE—ITS EFFECTS

THE general results of our inquiry cannot be mistaken. In the British Isles certainly, and probably in Western Europe generally, the best elements of the population are increasing, if they increase at all, at a much slower rate than the less worthy stocks, and, in some cases at any rate, the better classes are actually diminishing in number.

Let us proceed to ask what must be the inevitable effect of this wrongly-directed selective birth-rate. Natural selection, in mankind no less than in the rest of organic nature, improves the breed by eliminating the unfit and leaving the better-equipped individuals to become the parents of the next generation. If, contrary to nature, we reverse this process, deterioration is certain and immediate, and the race must eventually give way before a more naturally selected or wisely bred nation. Pestilence and famine have taken their toll in former ages, but while they have slain their thousands preponderatingly among the lower, weaker stocks, the falling birth-rate is preventing tens of thousands among the best and most worthy elements of the people from coming into existence. We have

reversed the action of selection, and are breeding to the lower types among us.

If the same decrease in reproduction had reached all classes of the community, its effects would have arrested more general attention. It would have changed to such a degree the Registrar-General's returns that the birth-rate of the country as a whole would have sunk below the death-rate, and a rapidly shrinking population would have become the most obvious problem of the age. Yet the actual position is more serious than one which immediately would have been recognized as a manifest danger. While the birth-rate of the best elements of all classes—of the skilled artisan no less than the landed family of ancient lineage and the professional man of eminent ability—is falling fast, that of the casual labourer of thriftless stock and of the feeble-minded class, still at large in our midst, remains at its old high level. Increased hygienic knowledge and growing medical skill keep alive an ever larger fraction of defective offspring to perpetuate the evils of which they bear the seeds.

The Jews and other foreign races in the East End of London maintain their natural birth-rate, and, to some extent, conceal the fall in that among Londoners generally. Whatever good qualities these aliens may possess, they are not those typical of the Anglo-Saxon ; and these immigrants cannot be regarded as a satisfactory equivalent to the native population.

Although this suppression of the best blood of the country is a new disease in modern Europe, it is an old story in the history of nations, and has been the

prelude to the ruin of States and the decline and fall of Empires.

Many causes, political and economic, have been assigned to explain the decadence of nations—slavery, lust of gold, foreign conquests, bloated armaments, loss of martial spirit, decay of religion, the power of a priesthood, a moral fatigue correlated in some unknown way with every civilization of long standing,—all in turn have been summoned to account for their fall. But the more insidious and far more deadly cause of a wrongly-directed selective birth-rate, which in a few generations must eliminate the best innate qualities of a people, is enough alone to explain the downfall.

How far other causes have contributed to the successive decadence of nations it is impossible to say ; but a study of history in the light of our present knowledge certainly suggests more and more that, in the survival and reproduction of the unfittest, we have discovered the most important clue to the true theory of the subject.

Indeed, as one looks back through the volume of ancient history most familiar to the average Englishman, one cannot help wondering whether Pharaoh's celebrated decree ordering the extermination of the male children of the Hebrews was not an effort to right the effects of what he deemed a misdirected selective birth-rate. He may have found it easier to destroy the children of the prolific alien population than to persuade the better classes of his native-born Egyptians to keep the balance even. Again, the feast of Belshazzar and his princes is undoubtedly suggestive. It needed some power outside the ordinary scope of

their ideas to impress on them the truth that they had been “numbered and found wanting.”

In Greece and Rome the acknowledged dearth of children in the patrician families, and in other families as successively they came to the front, gradually drained the races of all their finest innate qualities. In vain did Greek philosophers construct in imagination ideal states where only the best members should have offspring, to be supported and reared by the public wisdom and at the public cost. In vain did Roman Emperors bestow special privileges on fathers of three or more children. The duties and responsibilities of family life fell into disfavour among many of the best men and the ablest and most attractive women. The stock deteriorated, and the fruits of centuries of magnificent civilization were cast away. Mankind relapsed into barbarism, where the beneficent if stern effects of natural selection could again come into play.

Once more, the decline of Spain as a world-wide Empire was preceded by a drain of her best and most adventurous blood to the countries of the New World, a prolonged suppression of the finer and gentler qualities of mind and soul in the monastery and the convent, and a fierce destruction of all elements of free thought and independent inquiry by the dungeons and stakes of the Inquisition. Those alone who escaped these three-fold dangers survived to become the parents of each succeeding generation, and the average quality of the nation suffered rapid deterioration. The character of the modern Spaniard, attractive though it remains, has just those defects which would be found in the remnant of a magnificent race when

the more intense elements of adventurous energy, both in action and thought, had been eliminated.

If Greece, Rome, and Spain give us the best examples of the catastrophic downfall of mighty States, equally instructive instances of the action of unnatural selection may be traced among almost all nations.

The historical course of events seems to have run so clearly in recurring cycles, that a general impression of some common underlying cause is forced on the mind. In the light of our present knowledge, the process may be described in general terms.

Left to itself, in quiet times a nation is subject to the operation of natural selection. The better classes establish a dominant fertility, and the unsound stocks tend to be bred out of the race. By marriages and intermarriages among the more capable sections of the community, ability of various sorts and other effective qualities become collected in certain definite families throughout the people. An opportunity arises for national development—political, military, economic, or intellectual—and the families or individuals of appropriate ability rise to the occasion from all ranks. Hitherto, in the history of nations, stagnation has followed energy, a period of dulness has succeeded brilliant intellectual output. How far is this ebb of the tide historically explicable by our present line of thought? Doubtless the material for rapid advance gets used up, and some slackening of speed is necessary; but, in the actual historical cases, cannot we trace another cause, more subtle, more potent, and more secret?

The three great periods of economic and intellec-

tual activity in Europe are represented in England by the revival of arts and learning in the thirteenth century, and with the achievements of the reigns of Elizabeth and Victoria.

The two latter times of development are well shown by the increases in the numbers of men of sufficient eminence to be included in the *Dictionary of National Biography*. While the fourteenth and fifteenth centuries show the nearly equal numbers of 678 and 659 respectively, the sixteenth leaps up with 2138. The seventeenth and eighteenth are again nearly on a level with 5674 and 5789 names, although in the eighteenth the population begins to rise, but the nineteenth gives a total of 12,608. This last number is probably swollen both by the great increase in the number of the people and by the tendency to exaggerate contemporary achievement, as well as by the multiplicity of new callings which have given scope for fresh varieties of specialized ability, but it seems too large to be attributed entirely to these causes.

However we explain the facts before us, facts they certainly are, and are borne witness to by the unbiased record of the great *English Biographical Dictionary*. Something has been at work to produce definite fluctuations of ability throughout the ages of our history. The simplest and most direct cause, a variation in the number of able people actually born, may well be considered before other agents are called in to account for the phenomenon.

In the thirteenth century, we see the settlement of Europe into its constituent kingdoms after the turmoil

and conflict of the earlier anarchy. On this settlement followed the stimulus of the Crusades, the contact at Constantinople, in Spain, and in the East with civilizations which still preserved the traditions of Hellenic culture and philosophy. All went well, and the result was perhaps the greatest development in the intellectual history of Europe.

Now let us turn to the domestic annals of England for the sequel. The first Dominican friars landed in England in 1220; the Franciscans followed in 1224. "Within five years," we read, "they had established themselves in every important city in England"; and in little more than thirty years the Franciscans alone "had settled in forty-nine different localities, and had covered the country with a network of organization, directed to the furtherance of their founder's principles."¹ And what were those principles? "To teach men that religion was as compatible with a life of activity as with one of contemplation." Excellent principles indeed, and therefore to be bred out of the race as quickly as possible. The earlier monastic orders withdrew from parenthood those who were inclined to a life of study and contemplation; the friars set to work to prevent the transmission of the qualities of all who wished to combine active life and social ardour—in fact, the philanthropists, the reformers, the philosophers of the day. We read with dismay that with few exceptions every really great man of learning, who belonged to the Franciscan order, came from the British Isles; and repeated applications were made from Denmark,

¹ *Robert Grosseteste, Bishop of Lincoln.* by F. S. Stevenson.

France, and Germany for English friars, as superior to all others. "Nowhere," continues the enthusiastic chronicler, "has the order furnished so long a list of distinguished names." Roger Bacon, philosopher and man of science; Adam Marsh, mathematician, and trusted adviser of statesmen; Robert Grosseteste, the great administrator, Bishop of Lincoln and first Chancellor of Oxford; Duns Scotus, and Occham—"schoolmen of most original and profound genius"—and a host of others, not all absolutely of first rank, are passed in review; while the number of intellects in the second rank that were reduced to a life-interest only is left to the bewildered imagination. And then, after about a hundred years, "the rest is silence," or comparatively so, and England has to begin again slowly to create a fresh crop of great scholars and original thinkers.

A point of secondary interest as illustrating racial peculiarities (to be compared with the seafaring propensities of the men of Devon and the West Country), is to be drawn from the history of the friars, namely, the preponderance of the East Anglian element among the pioneers of the movement, which spread rapidly and took firm hold in that district. Canon Jessopp notes that of the first eighteen masters of the Franciscan school at Cambridge, at least ten were Norfolk men, while four of the first five Divinity readers at Oxford were East Anglians. Now three times in her history East Anglia has been greatly affected by religious movements. There the revival of the fourteenth century was most intense, and there lay the stronghold of Puritanism in the sixteenth. At an earlier period, too,

we cannot overlook the ardour which led to the establishment and maintenance of the great monasteries of Peterborough, Ely, Croyland, and Bury St. Edmunds, or the remarkable family of royal warrior-saints that culminated with St. Etheldreda. The East Anglian churches also are celebrated for their size and splendour, and the beauty of their internal decoration, wherever it remains.

The early manifestation of religion was suppressed by the massacres of the Danish invasions. The probable effect of the friars in breeding religious fervour out of the race has already been considered. Milman has called the Franciscan movement the “democracy of Christianity”; and doubtless there was something in its attitude of mind which appealed to the East Anglian temperament, in the same way as did the earlier and later developments of religious fervour. However, the close settlement and enthusiastic reception of the friars in that region must have led for a time to an effective elimination of this type of religious thought. Again, the very large emigration to America at a later period must have produced a severe weeding-out of the stronger and dourer elements of Puritanism. It will be interesting to see whether, at any future period, the characteristic East Anglian religious temperament rises again into national prominence, when it has had time to re-create itself by new genetic permutations and combinations among the people.

Let us now turn to a consideration of the Elizabethan age on the same lines as those suggested by our present train of thought. The causes producing

the stimulus to expansion are well known—the capture of Constantinople by the Turks with the dissemination of its traditional civilization, and the discovery of America, chief among them. But, looking within, we know that, throughout Europe the monastic orders had fallen into disfavour. In England, the actual force of the change must have been increased enormously by the wanton destruction of the monasteries by Henry VIII., and the loss to the nation of their accumulated stores of literature, art, and philosophy. But let us mark the compensating effect. The very completeness of the ruin forced the country to start afresh, to seek out new lines of development ; and if, on the one hand, the destruction of the monasteries led to great misery among the poor and their other dependants, and made necessary the Elizabethan Poor Law, on the other it set free much of the intellect of the country, and compelled it to start out anew to discover the road to learning and the path to intellectual eminence, unfettered by traditions of the past ; while, more important than all, it prevented the continual drain of the best intellectual ability of the country into the celibate life of the cloister. And so we were vouchsafed the crowning glories of the great Elizabethan age as the first outcrop, while a period of scientific and literary activity set in, which carried England on through the seventeenth century.

On the Continent, the movement fared otherwise. No Henry VIII. came so effectively to its rescue, or unwittingly set it so firmly on the right path. The existing powers grew alarmed as the great wave of thought passed beyond their control ; and nations, with

as fine or finer intellectual heritage than England, found themselves enveloped in the clutches of the Inquisition. Giordano Bruno was burnt in 1600, and a host of mighty men preceded or followed him to the stake, while others kept spiritual company with Galileo in the prisons of the Inquisition. In Spain, says Galton, from 1471 to 1781, by martyrdom and imprisonment, the country was drained of freethinkers at the rate of a thousand persons annually, while the monastic orders still flourished to catch any one whose intellectual ardour could adjust itself to the orthodox religion. In France, during the sixteenth century, between three and four hundred thousand Protestants perished in prison, at the galleys, or on the scaffold, while many escaped to England, to the lasting benefit of our race. Italy also was frightfully persecuted, and the episode of the world's history which began with such brilliant promise at the Renaissance was satisfactorily put a stop to on the Continent of Europe.

Once again the nations of Western Europe have recovered themselves ; once again in England we boast of the national glories, in literature, art, science, and administration, of the Victorian period ; once again a host of great names crowd upon our memories. But already some have seen signs of decadence. However that may be, we still have great men with us. But we cannot shut our eyes to the perils that lie ahead. And to what must we attribute the danger of a new period of decline and failure ? Not to the magnificent if ill-directed religious fervour of the thirteenth century, nor to the honest if cruel and narrow outlook of Catholic orthodoxy in the

sixteenth century, but to the utterly wanton, selfish, and senseless restriction of the birth-rate among the intellectual and able classes of the community. Surely the gods themselves must weep over the perverse stupidity of the human race, who three times in a thousand years have held such possibilities of glorious development in their hands, and three times have compassed their own destruction.

The history of European colonies, beginning with the discovery of America, and the early settlement of that continent by Spain, England, and France, has afforded a most interesting example in the development of population under the influence of different races, conditions, and environment. We can still trace clearly in the present populations and their international relations the effect of the various types of settlement.

The Spanish occupation of Central and Southern America was characterized by the spirit of adventure, the lust of gold, and the intolerance of the Jesuit missionary ideals. Men of courage and enterprise left the old country to carve out their fortunes across the Atlantic, and even to the last days of the occupation of Cuba, the Spanish colonies were too often treated merely as a source of income to the mother country, bound to provide careers and fortunes for her officials and money-seeking adventurers. But no persistent attempt was made to establish a permanent form of settlement, and few Spanish women accompanied their men-folk to the new continent. As a consequence, the proud and well-bred Spaniard mated with the native Mexican and Peruvian women, and some of his best qualities

were lost. Thus there grew up a half-caste breed, with characteristics and aspirations of their own, who in a few generations came to know little of their paternal ancestry. They easily broke with the traditions of Spanish civilization, and took an early opportunity of throwing off the Spanish domination.

The history of the English colonies in North America ran a different course. The country was explored by men of the same type as the Spanish adventurers, but the actual settlement was made chiefly by people who for various causes, political and religious, were discontented with the course of events in England. They took their wives and families with them, and represented a certain type of sturdy, self-contained, independent, somewhat uncompromising men and women, admirably suited to carve out their fortunes and establish themselves firmly under new and untried conditions. But the very qualities that took them out of England militated against the formation of a cohesive and adaptable nation ; and, the cause of their departure being largely discontent, prevented any warm feelings of attachment to the mother country. The ties between the two were chiefly those of mutual advantage—protection on the one side and commercial interests on the other. When, after the conquest of French Canada by British troops and fleets, the need for military protection ceased, when commercial interests clashed, the inevitable repudiation of the mother country, foreseen by at least one English statesman of the eighteenth century, took place. A small body of loyalists, whose heredity and reasons for emigration would well repay special study, moved off

into more congenial surroundings ; while the remainder, united for a time by their common desire to be quit of outside interference, were left to settle their own inherent differences at leisure.

When we consider how large a proportion of the early emigration to the eastern portion of the United States was due to divergence of religious opinion, chiefly in the direction of a pronounced democratic and individualist type, we understand at once the reason for the various outbursts of religious fanaticism in Pennsylvania and Massachusetts throughout the eighteenth century. We see also the nature of the material on which recent religious extravagances are able to work with so much ease and effect. Possibly also we have an explanation of the state of mind that hopes to do so much by vast educational expenditure, and is inclined, in spite of its own history, to attribute so little to the influence of heredity.

The history of the French settlements in Lower Canada is the history of the one reasoned attempt to found colonies which should reproduce the approved type of civilization of the mother country, and should form an additional source of imperial power and prosperity. The genius of Richelieu created the Company of New France in 1627. There were 120 associates ; the twelve largest shareholders were to be ennobled, to fulfil the feudal and paternal duties of the *ancienne noblesse* in the new territory. Two or three hundred artificers were included in the first batch of four thousand settlers ; all the emigrants were to be French Catholics, and three ecclesiastics were allotted to each *habitation*. But the movement was not sufficiently

supported from the military point of view ; Quebec surrendered to the English, and was only returned to France at the peace of 1632.

At this period, the missionary aspect of the enterprise probably offered the greatest attraction to the French people ; but before long Talon and Colbert resumed the policy of deliberate colonization, and between 1664 and 1674 the population of French Canada trebled under their careful guidance. Men of bad character were not allowed to stay in the settlements ; early marriage and large families were encouraged by every device and decree, such as bonuses on marriage and on large families, fines on celibacy, etc., while shiploads of young women as wives for the settlers were sent to stimulate the increase of population. The home government desired to establish joint schools for natives and settlers alike, hoping to create thereby a half-caste race, devoted to their interests. But the French Jesuits, with considerable scientific insight and wisdom, probably gained in practical experience, successfully opposed the carrying out of this scheme. They prevented or discouraged intermarriage with Indians, arguing that the Indian mind was incapable of a high development, and favoured for them a system of perpetual parental tutelage.

Here we have the nucleus of a steady, hardworking, sober, Roman Catholic nation, deliberately created and planted in suitable surroundings. The experiment in inheritance has answered admirably. We see the results after two hundred and fifty years in the loyal, industrious, prolific population of French Canada.

Two causes are responsible for the failure of the experiment as a source of imperial strength to the French mother country. The military aspect was neglected until circumstances connected with European politics had made Canada a point of strategic weakness in the French empire. In the second place, while the French settlers in Canada and the English settlers in New England were equally prolific, the English colonies soon had a great advantage in numbers of population, owing to twenty years of Puritan exodus from England ; while the French Huguenots, who were not allowed to land in Canada, filled up the vacant places at home. Only in the West Indies and the settlements round the Spanish Main were the French Huguenots and Jews permitted to establish themselves. The home government saw there no chance of forming colonies on the homogeneous type deliberately adopted in the North.

In spite of their larger numbers, however, the perverseness and want of unity of the British colonies gave a great military advantage to the loyal and united French, who, under capable and enlightened leadership, more than held their own, till Pitt, owing to the success of his containing operations in conjunction with Frederick the Great, and the establishment of sea supremacy, was able to pour overwhelming forces into America.

Here, then, we have three experiments in population and selective breeding on a large scale, which have been carried on over some three centuries. The results are well known to all observers ; the nature of the experiments, and the conditions under which they

have prospered or failed, can be studied in the historical records of the nations involved.

Every nation requires a constant succession of men of ability of every description to carry on the work of government, the industrial and economic life, the literary, artistic, and scientific development, in a manner appropriate to its special form of civilization, to its traditions in the past, and to its aspirations for the future. Moreover, such men are required in increasing and not in decreasing numbers, as the responsibilities and complications of government, whether imperial or local, develop. Undoubtedly in England there is ability of some sort latent in almost every class of the community, except in the very lowest and among the mentally defective ; but equally surely the various forms of ability have been sorted out during the past centuries by the action of natural selection, of like-to-like mating, of direct inheritance, and exist ready in certain strains in an intensified form. By the cultivation of a due sense of moral responsibility, by an appeal to the patriotism and foresight of the nation, by a proper adjustment of economic burdens, by a well-considered scheme of deterrent legislation, a nation can control its future composition and history to a much larger extent than has been suspected, and, whether it will or no, is always rising or falling as regards its inherent qualities. Good fortune and prosperity will attend on those communities who are the first to take advantage of and to apply the new knowledge. Natural selection, natural inheritance, and the conscious action of men, have divided the equine breed

into animals of such different types as the Clydesdale cart-horse, the thoroughbred racer, and the Shetland pony. The same natural forces, joined to the stress and strain of economic and international conflicts and to the unconscious action of the human race, have differentiated families of mankind in a similar way, if outwardly to a less marked extent. It is impossible to compare the history given on page 97, of a family which produced six generals and admirals in a few generations, the pedigree on page 89, where nine members were received into the Royal Society, and the account of the Bach family on page 87, with the notorious "Jukes" family, and with the family described on page 68, who provided four inmates for the special schools for the mentally defective, without realizing the force of the old saying that "by their fruits ye shall know them." "Do men gather grapes of thorns or figs of thistles?" Is it likely that we shall find statesmen, generals, inventors, and administrators in the ranks of the thriftless casual labourer and the feeble-minded? or that our leaders and governors will be as successful if we draw them from the untried and lower sections of the people rather than from the higher and proved fount of national ability and character? Evidently it requires several generations to ascertain, test, and fix the nature of the capacity latent in any one stock. A nation, having once fallen into arrears, cannot remake itself immediately on demand. There is no doubt that the phenomenon of restricted birth-rate in the successful and talented classes during the past forty years has appreciably, and to a certain extent irretrievably,

damaged the national credit and composition. Having realized this, it behoves the nation, individually and corporately, to take any and every step to prevent further deterioration, and as far as possible to recover the ground that has been lost.

The marked decrease in the average size of the family in the successful classes began, as we have seen, about 1875. One generation of those classes, the generation now in early manhood, consists of about half the number of individuals that should be found.

What are the probable and realized effects of this shortage of men and women of our best stocks compared with the growth of the people as a whole? How is it manifest in contemporary life? What will be its results on the character and future history of the race?

To discover the effects of the absence of these suppressed personalities, it is well to begin our inquiry by investigating what the corresponding people did in old days when they were brought into existence. Of one section of the classes affected, the stable families of the landed gentry, details may be obtained from *Peerages* and other similar books of reference.

Two series, each of about one hundred cases, were taken from the Peerage, as in our investigation into the average number of children born to a fertile couple. Those families only were considered who had held their title for at least two preceding generations. But, the object of the present inquiry being to discover what became of large families of younger sons, the hundred cases were made up from those marriages which had produced three sons or more.

The periods selected were the last half of the eighteenth and the first half of the nineteenth century. For the first period, between 1750 and 1800, 97 consecutive marriages, in which the succession to the title was involved, were considered. This represented a study of about a quarter of that part of the volume devoted to family histories, and resulted in the truly surprising total of 468 sons, or nearly five sons to a marriage. Of these sons, 34 died before reaching maturity, and in 131 cases the details given are not sufficient to permit classification, though it is quite clear from several indications that want of detail does not indicate lack of occupation. It is especially in the case of the eldest sons that particulars of the careers are lacking, owing to a faulty arrangement of the material involved. Of the 303 sons remaining, 119 went into the Army, of whom 21 died in the service and 34 became Generals; 57 went into the Navy, 12 lost their lives, and 20 became Admirals; 66 took Holy Orders, 14 becoming Bishops or Deans; 35 served the country in permanent posts, or entered the Diplomatic and Colonial Services; 14 went to the Bar, of whom 2 became Judges; 2 took up Medicine for a profession, and some few are mentioned simply as Members of Parliament.

The second period of marriages, between 1800 and 1850, gives very similar figures, though the slowness of promotion compared with that in the time of the Napoleonic wars leads to a smaller number of Generals and Admirals. From 111 marriages we have 511 sons. Of these sons, 48 died while immature, and 95 are unclassified; 169 went into the Army, of

whom 17 lost their lives, and 9 attained the rank of General ; 42 entered the Navy, of whom 5 died on service and 9 became Admirals. The Church accounts for 56, and 3 attained the dignity of Bishop or Dean ; 38 entered the Government Services, 16 went into the Law, 1 into Medicine, 2 into Banking or Commerce, and 26 became Members of Parliament.

The most noticeable difference in the two groups is in the number of those unclassified, and in the higher proportion in the earlier period of those who, having entered the Army or Navy, attained distinction or fell in the service of the country. The second difference shows the effect of the Napoleonic wars. It seems likely that the first difference is due, partially at any rate, to the insufficiency of family records in the earlier time, and that many of those, who in that period are unclassified, served in the Army or Navy, at any rate for a short while ; those sons being especially remembered whom family pride rejoiced in as having distinguished themselves above the average of their fellows, or family piety commemorated as amongst those who had fallen by the way on the path to glory.

In considering these figures as a whole, the first deduction we draw is that in past generations men who found themselves placed by birth in a position above their fellows, did not enter into the competition for increased wealth, but paid their debt to the country in actual personal service. The professions they chose are notoriously underpaid. They did not follow the advice of the Eastern sage to "take the cash and let the credit go," but steadily kept to the narrow

limits of national duty, and accepted at once the opportunities and limitations of their station in life.

It appears, then, that till recent years the majority of the younger sons of the class we are now considering joined the Army or the Navy or took Holy Orders. Of these three professions, the Army attracted by far the largest number. We should expect that the first signs of a proportionate decrease in the supply of children in the landed class would be found in a fall in the number of candidates for entrance into these professions.

Now it is a matter of common notoriety that while the would-be sailors are still many, the Army and the Church are suffering from a dearth of proper candidates. Doubtless many other causes may be assigned, and have been assigned freely, for this phenomenon. But surely one preponderant cause is not far to seek. One of our writers, on a certain mock-tragic occasion, tells us "No birds were flying overhead. There were no birds to fly." We may extract the essence of his wisdom and say that no younger sons are going into the Church and the Army for the simple reason that there are no younger sons to go.

In the Church and the Army, the average pay is too small for the standard of life of the classes it is necessary to attract. Hence these professions have relied in the past on filling their ranks from those who, from a sense of duty or from hereditary disposition, were ready to serve God in Church or State for an insufficient remuneration. From the beginning of the eighteenth century till recent years, there has been

a healthy reluctance in landed and military families to engage in commercial or industrial pursuits. Moreover, the country landowners as a class have shown exceptional public spirit in the history of local government throughout the last two centuries. The value of their unpaid work to the community has been borne witness to by competent and independent investigators.¹ The figures we have given to express the activities of their sons show that the same sense of duty to the community extended to national as well as to local affairs. It is clearly not a coincidence that a time when exceptional financial burdens, arising from both economic and political causes, have fallen on the shoulders of the country landowners, is marked also by a decrease in the number of their offspring. Simultaneously there has set in a want of elasticity in the supply of candidates for two underpaid professions, essential to the welfare of the community, which unconsciously had relied to fill their ranks largely on the patriotism and unselfish devotion to duty of a class which, from a certain section of its fellow-countrymen, has received little but misunderstanding in return.

In other professions, the dearth of duly qualified candidates is not yet as pronounced as it is in the Church and the Army. Other professions are better paid, and hence can draw for a time on different classes, as the supply of men, who would formerly have filled them, contracts.

The first-class Civil Service examinations show a fall

¹ See the *History of Local Government—The County*, by Sidney and Beatrice Webb.

in the numbers of candidates from a maximum of about 250 to about 180 in recent years, but this decrease is assigned at present by the Commissioners to a better knowledge of the standard likely to succeed. Candidates whose chances are hopeless now very seldom compete. But every year, as scholarships increase and our educational ladder becomes easier of access, the net of the well-paid Civil Service is cast wider. Hence we should expect this particular career, served pre-eminently as it is by our fast-developing system of competitive examination, to be the last to show a decrease in the number or examinational quality of its candidates for admission. Whether promise, as tested at entrance by examination, corresponds with performance, as tested by the results of public service in after life, would be an interesting and not an impossible subject of study.

But while the Civil Service still attracts sufficient numbers who can pass its examinational doors with credit, there are signs in the higher ranks of employment generally that the demand for competent men is greater than the supply. It is impossible to watch the passage from the University into the world of each year's crop of graduates, without seeing more and more that men of character, ability, and good manners find posts waiting for them almost before their necessary period of training is completed. A family in which these qualities are hereditary need fear no difficulty in securing careers for their children.

Not only do the entries into certain professions show signs of a decreasing supply of competent men, but certain phenomena noticed in the public

schools are assigned by qualified observers to the same cause. The numbers of boys at the few schools acknowledged by all to stand first in public estimation have increased much and rapidly. But many of the smaller schools, which used to depend largely on local families for their support, are suffering severely from diminished entries. Some with good records have had to close their doors.

Now these two apparently different effects are probably due to the same cause. In old days, the smaller gentry of the neighbourhood, from motives of economy no less than local patriotism, sent their many sons to the well-known school, not expensive and near at hand, which they themselves had attended. Now the same local families have but one or two sons each, and, less affected in consequence by questions of cost, endeavour to send them to one of the most fashionable schools, perhaps in a distant part of the country.

We must now turn to the consideration of the effects of the selective birth-rate on other classes of the community.

The recent Old Age Pension Act affords material for reflection in connection with this part of our subject. In accordance with the impulsive habits of the British nation, to whom a reasoned train of investigation and inquiry, followed by slow and tentative remedial measures, appears to be difficult, something was felt to be wrong, and, without going to the root of the question, something was done to put matters right. The forlorn condition of the respectable poor was indeed a grievous

problem ; there was especial emphasis on the word "respectable."

Forty or fifty years ago, the thrifty and far-seeing workman desired and often produced many children, who were legally bound to maintain him and his wife in their old age ; and the burden, spread over a large family, was often not very serious. At any rate there was neither a demand nor a need for old age pensions in normal cases. But, as we have seen from the Friendly Societies' returns, it is precisely the *respectable* workman who, for the last twenty or thirty years, has restricted his family most severely. And now, as he grows old and past work, his maintenance becomes a well-nigh intolerable burden on the one or two children, who, possibly with families of their own to rear, suffer acutely, largely owing to the suppression of the brothers and sisters, who would have shared the responsibility with them at this juncture. So the pressing need and outcry for old age pensions has arisen ; exactly at the psychological moment to fit in with results and dates which might have been deduced from the statistics previously given.

Now, with the fundamental proposition of the Old Age Pensions Act we have nothing to do at this present moment. It may be, and possibly is, perfectly right and desirable that the community should step in, and that the maintenance of those respectable members of society who are past work should become a general rather than an individual charge. But, if the community undertakes the duties of the children, it might not be unwise on its part to make some inquiry as to the actual existence and number of those children

whose responsibilities it assumes ; for it runs the danger of removing yet another motive for calling into being the individuals whose place it has cheerfully occupied. From whatever source the necessary money be raised, it is clear that those members of the working classes who have abnormally small families, or have produced worthless and undutiful offspring, will now be supported in their old age by funds taken from the strong and capable members of the community. The competent ones can therefore afford, without regard for the future, to restrict still further the number of their children ; while the incompetent, heedless of consequences, can produce a larger number of useless members of society, from whom neither they nor the State expect or receive any return.

That the strong should support and assist the weak is an excellent maxim, one with which most people can agree cordially in theory ; but, if in practice it should happen to lead to each vigorous and thrifty family in the country reducing its offspring by yet another one, and every pair of weak and casual parents creating two more unsatisfactory children to be supported and assisted in their turn, there is obviously a very dark lining to the silver cloud of altruism. In the ideal state, as we all know, great pains were taken to make the punishment fit the crime ; here, in England, we have lost an excellent opportunity of adjusting the reward to the services rendered to the community.

The recent report issued by the majority of the Commissioners on the Poor Laws does not at any point deal directly with the problems raised by heredity,

although the Commissioners admit that they are at a loss to account for the phenomena they were empowered to inquire into, by any economic, moral, or political causes. We will quote their conclusion :

"It is very unpleasant to record that, notwithstanding our assumed moral and material progress, and notwithstanding the enormous annual expenditure, amounting to nearly sixty millions a year, upon poor relief, education, and public health, we still have a vast army of persons quartered upon us unable to support themselves, and an army which in numbers has recently shown signs of increase rather than decrease. To what is the retrogression due? It cannot be attributed to lack of expenditure. Is this costly and elaborate machinery we have established defective, and if so where does it fail to accomplish its end? Is the material upon which this machinery operates becoming less amenable to the remedies applied? . . . The statistical review of the expenditure incurred and of the results attained by it prove that something in our social organisation is seriously wrong, and that, whatever may be the evils, they are not of such a nature as to be improved or removed by the mere signing of cheques or the outpouring of public funds."

Two other statements incorporated in the general survey of the Poor Law Commission are also of interest. The first suggests that general education, the remedy from which so much was looked for in 1870, has failed in one of its objects. We read : "A generation has elapsed since elementary education became universal, and the benefits to be derived from the system should now be accruing to the nation.

Persons now above fifty years of age have not, it is true, participated in the advantages conferred in 1870, but of persons below that age we have shown that there is no diminution in the number coming upon the Poor Laws."

Again, in a statistical comparison between able-bodied pauperism in urban and rural districts, the Commissioners point out :

"The consideration of these statistics leads to the conclusion that it is in regard to the able-bodied that least progress has been made. Indeed it would appear that there has recently been a considerable retrogression in this branch of the Poor Law. Either the urban population is becoming less fitted for maintaining their independence, or the facility with which relief may be obtained and the immunity from labour which it confers are enticing a larger number of persons to avail themselves of Poor Law relief."

The Commissioners also state that, in a recent year, between 30,000 and 40,000 able-bodied men in health received outdoor relief without any task or work. In large towns the number of cases receiving such treatment is apparently increasing.

Out of their own conclusions in another section, it seems possible to suggest an explanation for the failure of the Poor Law Administration to diminish the evil with which it has had to contend. In the section on Bastardy, after pointing out that, in one workhouse, out of 229 births in five years, 77.2 per cent were illegitimate, they say that nearly all the mothers in the latter section were mentally weak, in most cases approaching the state of imbeciles. Another Royal

Commission, appointed to report on the care and control of the feeble-minded, had previously shown that mental defect was hereditary, and recommended that persons suffering in such ways should be detained compulsorily in labour colonies, as the only way of eliminating mental defects from the people. The Poor Law Commissioners adopt this recommendation :

“If, as we hope, the recommendations of that Commission are carried into effect, a system of control over the feeble-minded will be initiated, which will put an end to one of the most prolific sources of pauperism, and free the Poor Law Administrator from one of his greatest difficulties. Meanwhile, we think that, as a provisional measure, the Poor Law authorities should be given power to detain feeble-minded mothers of illegitimate children who come under their care.”

Again, dealing with the same subject :

“For depraved women we recommend that the Local Authorities should have power to arrange for their detention in suitable institutions. Should these recommendations be carried into effect, we confidently anticipate a great diminution in the numbers of the latter class, and also in the numbers of illegitimate and degenerate children who are born only for an early death, or to become a lasting burden upon the Community.”

Here we have a distinct recognition of the influence of heredity on this section of pauperism. Indeed, the question is too clear to admit of any doubt. But the same train of reasoning might have suggested the same influence at work in other departments of the inquiry. It is surely as undesirable to increase the

number of vagrants and work-shy paupers as of the feeble-minded. The only difference of treatment should be that the one class are now known and recognized as incurable, and a source of national weakness, and should be dealt with as such forthwith ; while the other class might be afforded, under suitable control, the opportunity for demonstrating to the satisfaction of the community whether, as a result of training and opportunity, a capacity for steady work and honourable existence is or is not latent in them.

It is stated that about 15,000 births take place annually in the workhouse wards, of which 30 per cent are legitimate. It is unfortunate that there are no details as to the occupations, character, and record of citizenship of the parents, who are not in a position to fulfil the economic duties of parenthood, but are responsible for giving birth to this annual crop of 5000 legitimate pauper children. A history of the subsequent careers of these children would also be extremely desirable.

There is a danger of focusing public opinion on a question of the magnitude disclosed by the Poor Law Commission, involving an appreciable fraction of the population. At once we are aware of a tendency to lose the sense of proportion, and to assume that our future social legislation must regard the people who have made shipwreck of their lives, and shown themselves incapable of directing their own affairs to any advantage, as the normal inhabitants of the country. There is consequently a great temptation to provide such an army of officials and institutions for their oversight, reception, and relief, that it is difficult

for any one on the margin to remain outside the infected area.

Nevertheless, the problem of pauperism is one of pressing importance, and depends far more on the inheritance of human faculty than has been recognized. Doubtless much unemployment and some consequent pauperism are due to our want of organization of the labour market. There is no month of the year when some trade is not at its busiest, and a network of labour exchanges could do much to suppress seasonal unemployment. But when this is remedied, and when allowance is made for dislocation caused by cycles of good and bad trade, the evidence available goes to show that some of the unemployed are in reality unemployable. They have neither the will nor the capacity to undertake steady work. As long as the feeble-minded and the habitual criminal are allowed to multiply at will, so long will a section of the community remain parasitic on the rest; an expense to, and a drag upon, their more efficient fellows. As we have quoted above: "The character of every race of men is the real limit to its numbers." Men of higher ability will make more of the natural resources of a country, will produce more sustenance. Moreover, it is clear that, other things remaining unchanged, a rise in the average ability of the race would mean increased ease for every one in their allotted task, both individually and in the saving of labour now expended in supporting the incompetent. Again, as more and more of the unskilled labour of the world is done by machinery, there will be less and less demand for unintelligent workers. Ability in mind and technical

skill in manual craft will increase yet more in relative importance, and in the future the need for these qualities will grow faster than the population.

Besides applying the immediate remedies required to meet the superficial symptoms of present unemployment, we must learn to go to the root of the matter by securing once more a rightly-directed selective birth-rate, or be prepared for Nature to resume her own ways of eliminating the unfit, after some form of social cataclysm.

The truth is that a generation which has set great and unwarranted stress on success in examinations as a test of individual ability, has rebelled against the far truer and more profound view of continual utility and prosperity in life as the test of the worth of a family. While acquiescing in and encouraging the sorting-out of able individuals by a purely academic method, we have discountenanced or disowned the results of the far severer and more searching discrimination of natural selection and inheritance. From the point of view of the nation, the individual is too small a unit to deal with or to judge from. Even when apparently sound, he may bear in him the hereditary seeds of disease, crime, or mental defect. The family is obviously the true scientific unit of the sociologist, the only safe guide in forming any estimate of the possibilities of the nation as a whole.

CHAPTER X

THE DECLINE IN THE BIRTH-RATE—ITS CAUSES

WE are now in a position to take stock of the whole subject of the recent fall in the birth-rate, and to try to find some tentative explanation of the causes at work.

It is perfectly clear that there is no appreciable diminution of the natural fertility of the nation, since the Clergy, the Roman Catholics of all classes, and the Jews, as well as the miners, the casual labourers, and the feeble-minded, are unaffected, or affected to but a slight extent, by the decline in the size of the family prevalent among the majority of the well-to-do laity and the thrifty skilled artisans. It is possible that some small part of the decline might be traced to the natural and direct effects of luxury, restlessness, or overfeeding ; but by far the greater part of the fall is only indirectly connected with those faults of modern life. In the mass of the community, the able, competent, and successful stocks, who until recent years probably produced relatively nearly as many children as the lower-grade stocks, and certainly reared a far larger proportion, have come to the conclusion that they do not wish for large families, and are voluntarily restricting

the number of their offspring. This conclusion has also been reached by the Registrar-General as the result of his returns.¹

Burke has well said that you cannot draw up an indictment against a nation. Nearly the whole of the successful classes of the British Isles are pursuing steadily a certain course of action, quite oblivious or regardless of its ultimate effects on the community. Clearly they must have some grounds, however mistaken, for thinking that they are acting wisely and rightly, or, at all events, some excuse which reconciles their conscience to conduct followed for what they regard as their own advantage.

A full discussion of the subject is impossible. In this place we propose to consider only the main point—Why the classes in question wish to limit so closely the number of their offspring. But, after all, this is the essential problem. If the preference for small families were not existent, if people did not wish to have few children, the birth-rate would not have shown such a tremendous diminution in any circumstances. To realize the possibility of a course of action would not lead to its adoption, unless the desire to follow it were already existent, or ready to be called into being. Thus, to limit our inquiry to the reasons which lead people to wish for few children is merely to concentrate attention on the real cause of the decline in the birth-rate.

It is evident that no one cause can be sufficient in itself to explain a phenomenon which affects so

¹ See *Blue-book on Public Health and Social Conditions*, 1909, p. 5.

many different classes, so many persons of divergent aims, ideals, and circumstances. Various causes must be at work to produce so widespread a result, such a general tacit agreement at once to restrict the number of offspring:

We must, then, look for many contributory tendencies. An economic pressure, though doubtless important in some cases, cannot be universally paramount, when the results to be explained are apparent among eminent professional men as well as artisans, among financial magnates as well as impoverished country landowners. No one ideal of life can cover all cases, when we have to look among high-principled men and women of marked public spirit, as well as among those who waste their lives in a perpetual round of selfish and idle amusements.

Let us begin by analysing a cause to which reference has been made in the last chapter ; a cause which, we believe, has been very potent among some of the best of our population. The feeling of overwhelming responsibility towards possible children is a product of our developing moral sense, and in itself is a right and desirable feeling. When directed towards securing the best parents for the succeeding generation, it is perhaps the most important of the agencies to which we must look to preserve and improve our race. But when the feeling of individual responsibility takes the form of restricting the number of children, even in a healthy and able family, to those for whom it is possible to make a perfectly secure pecuniary provision, it degenerates into mistaken kindness, and, in

view of the importance of continued selection to the nation and to mankind, it becomes an imminent danger to the country, and high treason to the human race.

It is also a short-sighted policy towards the "family," since it does not look beyond one fleeting generation. The eye of faith sees possibilities in grandchildren and great-grandchildren, who may rise up and bring fresh credit to the stock.

As His Eminence Cardinal Mercier, Archbishop of Mechlin, well says in his Lenten Pastoral address for 1909 on the duties of married life : "Ne croyez donc pas faire œuvre de sagesse en conviant vos fils à s'asseoir au degré de l'échelle sociale, où votre énergie et votre esprit d'épargne vous ont fait monter. Apprenez-leur que le point de départ importe peu, que ce qui importera, pour eux, ce sera leur point d'arrivée."

The motive we are considering probably takes somewhat different forms among the upper classes and among the skilled artisans. The upper and professional classes have found difficulty during the last forty years in placing all their sons in suitable positions with sufficient salaries. This difficulty, as we have said, is now becoming less, owing to the increase in the number of appointments to be filled, and the lessening supply of competent men to fill them. But doubtless it has been acute at times during the last half-century. Its causes are interesting, and repay historical study.

Till the end of the seventeenth century, till a standing Royal Army and a permanent Navy were firmly established, it was impossible to bring up to a definite professional career those younger sons of good houses

whose talents did not lie in the direction of the Church or the Law. Hence, with no feeling of degradation, they became yeomen or farmers, or passed into the trade of some near or distant town. In this way, good county names became common among the farmers, the country labourers, the craftsmen of the town, and their apprentices. As the population of the country seems to have remained almost stationary for several hundred years, while the average number of children born to a family was much greater than at present, natural selection must have been very severe. Only about one-quarter of the children born survived and became parents. Any hereditary weakness tended rapidly to be bred out of the people, and the overflow from the stronger stocks easily made room for themselves below. All classes were permeated with good blood, and the country was filled with sound stock to supply the wastage of the weaker strains brought about by hardship, pestilence, or famine.

During the eighteenth century, the figures we have given in the last chapter show that the majority of the younger sons of the landed aristocracy passed as a matter of course into the Church, the Army, or the Navy. Considerable prizes fell to a successful general or admiral, and the whole of the Services, if not adequately paid, gave a fine adventurous career to a man of high courage and public spirit. With such openings before them, younger sons of good birth ceased to adopt agriculture or trade, which consequently dropped in public estimation.

In any nation it is well that members of those families, who by character, good abilities, honourable

ancestry, and their probable accompaniment of some accumulation of material wealth, have attained a position above that of the majority of their fellow-men, should serve their country in unpaid local government or ill-paid public services. In the first place, such a custom helps to emphasize the dignity of work for work's sake ; it establishes an excellent principle that public service is a privilege which should entail some personal sacrifice—a service in which additional material comfort is less to be regarded than the consciousness of well-rendered public duty. Moreover, it safeguards the purity of public life, since it is the spirit in which the work is performed, and not the remuneration by which the post is paid, that is the criterion of success or failure. Thus it sets before the nation a higher ideal than that of the market or the counting-house, and shows that, even among the majority of the people, where a livelihood must be the first consideration, the manner and spirit in which a profession is followed should be of more importance than the actual material profit to be realized. This is a point of view especially to be emphasized in a country like Great Britain, where men have always been tempted to set too much store on commercial interests and supremacy. It sets a good example both to the "idle rich," who fail to appreciate their moral obligation to repay in voluntary service to the community the means with which they are endowed as a trust, and to that large section of the labouring class who never put their heart into work for which they are paid. Probably the work neglected or but half done by wage-earners, and the material injured or destroyed

by them, involve as large an economic loss to the community as the money wasted by those who have means to live without a profession.

The consideration and honourable regard shown to the men who have so worthily occupied the unpaid and underpaid posts of the country, have led many people to assume that these attributes belong to the posts themselves, rather than to the holders of them and their personal qualifications. They have reasoned either that the posts in question should be sufficiently highly paid to enable any one to fill them and to live in the same style, or they have felt that no one should be in possession of wealth which enables him to do work without accepting pay. Their attitude of mind recalls the childish tale of Rosamund and her Purple Jar ; it was not the jar but the substance with which it was filled that produced the attractive glamour, as the poor child found to her cost. In either train of argument, they ignore entirely the immense moral gain to the nation in the example of admirable public service, seeking nothing for itself, and the inestimable advantage of a body of tried and talented men who can afford to choose or alter their sphere of service according to the needs of the day. Throughout our history, England has always had this great reserve of local public servants, on whom she could draw in normal times and in emergencies. For the most part they have worthily and proudly adopted as their motto that of the first subject of the Crown, " Ich dien."

The overcrowding of certain professions and careers, which without doubt has occurred in recent years, may

be due partially to certain faults in our recent methods of education. Both our public and elementary schools have been much to blame, the one in that they failed to modify the type of education to suit the altering conditions of national life, the other that they tended to deprecate manual activity and craftsmanship, and over-supplied the ranks of the clerks and penmen. The great public schools go on training their boys chiefly in classics and ancient literature, when the demand has been for men of general education, for men of science, for economists, engineers, and scientific agriculturists, of the same class and breeding as the men supplied by the public schools. The classically trained men have difficulty in finding openings in after life, owing to their type of education. The men educated scientifically in schools of other types are often rejected because their heredity and training leave them unfit to deal with men, especially with workmen, foreigners and natives. Moreover, from the employer's point of view they often lack the guarantees of character and the intuitive sense of masterfulness that are the usual concomitants of the man of good family.

In any scheme of primary education, the object should have been to provide for a general awakening of the intelligence, by observation, reasoning, and practical knowledge, with special attention to manual training and the elements of domestic life. Here the framers of the code of 1870, assuming that many homes would continue to supply these qualifications, devised a curriculum—excellent as an alternative—to give every one the education suitable for a clerkship or the teaching profession. But withdrawing

the children from the homes, the fields, and the work-shops, prevented their receiving the home and industrial training previously given, and probably unconsciously relied on by the framers of the new code. The growing reluctance to pay school pence, and the consequent enactment of free education, seem to indicate that the type of training given in the schools was not found satisfactory by the parents ; while the general loosening of parental control and responsibility has done much to destroy all habits of discipline and attachment to home among the children.

Now the art of reading and writing one's own language, an accomplishment which is useful in all spheres of activity, is by no means proof of education, or of any preparation for the practical duties of life. It is true that a purely literary training, such as the elementary schools have attempted to give, prepares men who are in possession of it to enter upon the heritage of thought, knowledge, and sentiment, which men of all ages have bequeathed to mankind. But if neither time nor inclination exists, or is likely to exist, to follow or advance learning for its own sake, it is of no use laboriously to acquire the means of doing so, while sacrificing the satisfaction to be got out of manual labour, craftsmanship, and a knowledge and command over outdoor life and nature. It is probable that the framers of the code did not realize the intense pleasure to be obtained by the creation of anything, by manual labour and craftsmanship no less than by literature or art. This pleasure is much more within reach of most people than is the creation of something depending on a literary education or the philosophic

bent of mind. We have forced nearly the whole of a community, particularly ill adapted to abstract thought, into a purely receptive and imitative mood, and debarred them from the satisfaction of original and creative action. This mistake has produced a listlessness of mind, a want of confidence and of interest in the occupations of daily life. It has taken away the desire to attempt where there is no opportunity of excelling.

As Sir Joseph Thomson has said : "It is possible to read books, to pass examinations, without the higher qualities of mind being called into play. Indeed, I doubt if there is any process in which the mind is more quiescent than in reading without interest. I might appeal to the widespread habit of reading in bed as a prevention of insomnia as a proof of this. But it is not possible for a boy to make a boat or for a girl to cook a dinner without using their brains. With practical things the difficulties have to be surmounted, the boat must be made watertight, the dinner must be cooked."

In so far as the present type of education picks out the children whose class of mind is more suited to their new surroundings, it has had a good aspect. But it fails to provide for and encourage those who are better left in their old sphere, with the result that many unfitted for the change have been moved away.

The British nation as a whole owes a great, and for the most part unpaid, debt of gratitude to Ruskin, William Morris, and other teachers, who, at a period when little encouragement was bestowed on their ideas, consistently endeavoured to raise the value of good

workmanship in the public estimation. By example and precept, by an appeal to the past history of nations, they sought to enforce the doctrine of the dignity of manual labour, to illustrate the beauty and interest of craftsmanship, and to emphasize the moral lessons to be obtained from the performance of accurate and artistic handiwork. Had their views of life and labour been more generally accepted, we should have escaped from the conception of manual labour as something in itself degrading—a conception which has proved such a stumbling-block in the way of those who, unfitted for the sphere of intellectual development in which they find themselves placed, have disdained to exchange it for the honourable and natural surroundings of good manual work. As long as such an exchange is associated with the sense of social catastrophe and personal disgrace, so long will many of those born into the more prominent intellectual classes, a sphere for which they personally are unfitted, have to be kept up artificially by the exertions of others. Much unproductive labour is thus expended, and a great loss to the community ensues in waste of wealth, time, and happiness. Moreover, this interchange of spheres of occupation is an integral part of any scheme by which those suited to intellectual activity are brought into positions where their abilities are best employed. Indeed the idea of a social *ladder* is a false analogy, productive of much ill-feeling ; we require to build *bridges*, with free passage from either side, where the spirit in which work, whether manual or not, is performed, and the moral effects of his occupation on the workman, are the true criterions of success or failure.

From our immediate point of view, the worst result of our educational mistakes consists in overcrowding with unsuitable men those careers which the present type of education is especially designed to serve. The economic balance is upset, and a vast amount of ill-performed, and therefore partially unproductive, labour injures the efficiency of the nation and diminishes its means of subsistence. Such are some of the causes which have given rise to the past want of suitable openings for the children of all classes, and to the consequent striking absence of those children themselves.

Another aspect of the same mistaken idea of education is seen in the stress laid on competitive examinations as a means of filling administrative posts, and as a test of fitness for after life.

Competitive examinations have two obvious effects. They favour the candidates who are best able to afford, and do not realize the harm, of a long and intensive form of early specialized instruction, and they put a heavy premium on those whose mental powers either develop precociously or are forced into a premature awakening. Neither of these results can be welcomed by any one who understands the problems involved in the education and well-ordered development of mind and body. It is probable that the policy of competitive examination, when driven to excess, has resulted in closing partially the doors of various honourable professions to those who, in due course of time, would have been best fitted to excel in them. During the last two centuries, the landed and official classes could

be certain of obtaining for many of their sons posts in which, at all events, a living wage was secure. Now the posts are filled by competitive examination from a much larger field. Hence, one of the difficulties in past years of finding suitable occupations for large families of normal sons ; hence, possibly, a motive for the present almost entire absence of the said large families of normal sons. But the process has now gone so far that, even with the enlargement of the area of selection, suitable men cannot always be found to fill the posts available.

As a means of re-sorting the elements of our population into more efficient combinations, the system of competitive examinations has dangers not always recognized. Examinations may be used to pick out an individual in early life, and transplant him into a sphere for which his ancestral history, his boyhood, and his home surroundings have not prepared him.

A man who rises too young and too fast is apt to marry late or not at all. He has often considerable difficulty at first in finding a wife who will assure his position in the class to which he has attained. A study of such data as are available indicates that, if he does marry above his original station, he carries to an extreme the present fashion, and has very few children. Hence it follows that an efficient system of catching ability from all classes, and making it too easy for its possessor to rise, means an efficient method of sterilizing ability, and of slowly or quickly breeding it out of the nation. Better that an able carpenter should develop slowly into a small builder, leaving six tall sons to play their part manfully,

and, perchance, rise one step more, than that he should be converted by a County Council scholarship into a primary schoolmaster, or second-grade Civil Service clerk, and that there the usefulness to the race of the innate abilities of which he is the temporary trustee should cease for ever. His services are bought at far too high a price. Verily they were good sociologists as well as good divines who taught every man to determine in his youth "to learn and labour truly to get mine own living, and to do my duty in that state of life unto which it shall please God to call me."

Hitherto we have been dealing with the economic aspect of the question from the point of view of the future careers of potential children. Here the motive for restricting the size of the family is the sense of responsibility for the children's future.

But the economic motive often takes other and more selfish forms. In every rank of life children are an expense—an expense which falls heavily on all save the very rich and the thriftless pauper. It is unsafe to generalize from cases where Scotch moors or 60-horse-power motor cars are found to be a cheaper form of extravagance than children. In almost every household, luxuries must be foregone, in some even comfort sacrificed, if the number of children to be housed, clothed, and educated becomes large. The life of the unmarried man or woman of means, or of the childless married couple, is one of greater freedom and immeasurably less financial responsibility. In some families each new child may mean actually less food

and other necessaries for the existing members of the household.

What can we oppose to such strong pressure? How can one encourage children of sound and able parents?

Besides the absorbing interest of bringing into existence and guiding the development of those who may be expected to play honourable and useful parts in the history of the nation, there is the wholesome instinct of family, which leads us to take special care for the future of our own name and race. To secure the continued existence of a family a considerable number of children are a necessity. With the changes and chances of this mortal life, there is great probability that the names will soon be clean put out of those who, in homely phrase, put all their eggs into one basket, or even into two or three.

For the welfare, happiness, and training of the children themselves a fairly large family without doubt is best. Moreover, a time frequently comes when positions are reversed, when the parents, and other members of the older generation who have less claim, may be a source of anxiety to the children. Then arises the duty of sharing exhausting care, or even financial responsibility, instead of merely dividing possessions. In such cases, the many again have advantages over the few, and happy are the parents who need not look to strangers for care and sustenance in their old age.

Perhaps in time to come we may devise arrangements which may reinforce these arguments by lightening the immediate economic burden on parents. It is

an axiom of sound finance to let the incidence of taxation fall on the luxuries rather than on the necessities of the nation. Alcohol, tobacco, spectacular and all-absorbing games, constant travel, are luxuries, and probably, in many aspects, very mischievous ones. The rearing and education of children, in a fashion appropriate to the positions they are capable of occupying, is a matter of primary importance to the State at all times, and particularly at the present day. The cost rises rapidly with the importance and responsibilities of the careers for which the children are fitted. Neither a well-earned nor a well-spent income is a source of taxation on which a Chancellor of the Exchequer should look with a greedy eye. As far as expense is responsible for the declining birth-rate of the best stocks, it is certain that exemption from income tax of all moneys spent in any rank of life on the maintenance and education of children would in the end greatly benefit the one real source of national credit, the composition and character of the life of the people. It would be well, too, that the graduation of death-duties should be transferred to the taxes on legacies. It is the amount a man receives, not the sum his father leaves, that should be taken as the basis. A fortune divided among ten children should be taxed less than one that goes to an only son or daughter.

Scholarships have their dangers when used to raise those who win them too suddenly and completely out of their natural class. But, when used to educate in a suitable manner the abler children in all stations of life, they can produce nothing but good, both to the

children themselves and in lightening the burden of offspring on their parents. The probability that the children of competent parents will be able to win scholarships will be a motive of the right kind. Moreover, we may come to see that the most expensive type of education is not a necessity. Even in matters of education, there is a tendency to attribute far too much effect to outside and expensive environment, and to lay too little stress on heredity and the traditions of the family.

Each age has accused itself of increasing luxury, probably with a considerable amount of truth, since there is a natural growth of comfort as the arts and sciences improve the conditions of life. But the special forms that the rising outlay of the present generation has assumed of late years have helped to intensify the restlessness and desire for change and excitement, the gratification of which is made possible by improved means of locomotion and communication. The great hotels, caravanserais, and restaurants, both at home and abroad, stand out as landmarks of the gradual disintegration of family life. They represent a state of mind absolutely incompatible with the quiet privacy appropriate to the upbringing of a growing family ; and seem to emphasize the desire for variety, for luxury, for society, without any attendant duties and responsibilities.

The entrance into the upper ranks of our people of increasing numbers of persons, of various nationalities as well as our own, whose newly acquired wealth is not associated with definite territorial or local associations, has doubtless affected, and to some

extent demoralized, the habits of those sections of the community who have had the misfortune to come in contact with them. One is tempted to think that the simplicity of a home life which would fit any child for any career is exchanged for the more elaborate paraphernalia of luxury and display, quite as much on account of the preference of the parents for an extravagant style of living as for the real advantage of the children to whose welfare it is sometimes charged.

The cult of games, too, for which the present age is conspicuous, has probably done much harm. Games are excellent for young people; the moral and physical training they give cannot be obtained otherwise. Even in mature age, they provide healthful exercise, and, taken in moderation, give a much-needed mental relaxation. But of late years there has set in an organization of professionalism, with its attendant evils of a publicity developing into notoriety for successful players, and the establishment of an endless number of championships of every imaginable kind. Thus games have become exalted till they have become the serious object of life and the subject of incessant thought and conversation, not only to those who spend too much time in play, but also to others for whom they are but spectacular indulgences. Had this excessive interest in games and sport been confined to men, from our present point of view it might have been less disastrous. But with the growing tendency to assimilate the lives of men and women, wives and mothers too often place their desire to participate in the pastimes of their husbands and brothers before the welfare or existence of their actual or possible

children. The care of a young family, even if expense be no consideration, is incompatible with unceasing social activity, with perpetual motion, or with untiring devotion to games or sports in either parent, and especially in the mother.

It is perhaps significant that, as we have shown above, the decrease in the birth-rate is very great in military families, where, partly from the requirements of their profession, and partly from the character of the society that frequently gathers round them, the restlessness and uncertainty of modern life are emphasized; while there is far less sign of decreasing birth-rate among the families of the clergy, who, from the nature of their office, are debarred from constant journeyings, and find, both for themselves and their wives, a sufficient sphere of influence and activity in the domestic concerns of their parish life. The high moral sense and devotion to duty characteristic of the clergy not only result in the presence of a larger number of children in clerical homes than is now usual among laymen, but give those children when born an excellent average character. De Candolle has shown by a statistical inquiry that the Protestant clergy of all countries produce a very high proportion of eminent sons. Doubtless, besides the sound heredity, the cultured frugality of the normal clerical household makes a good environment for a growing intelligence. The maintenance of the birth-rate among the clergy should be a source of national satisfaction.

While, among certain sections of the upper classes, women have been impeded in their true duties by the desire to share the amusements to which their husbands

and brothers have become too much addicted, among another section they have suffered as much, or perhaps even more, from the wish to take an equal part in man's work instead of his play.

The intellectual and political development of the last half-century has been accompanied by an unfortunate tendency to belittle the home duties for which women, by their essential nature, are specially responsible. For this tendency men are to blame at least to the same extent as women. Both sexes have failed to appreciate the high honour which should attach to the successful performance of the true womanly duties. To bring forth, nourish, and educate children is, for the future of the race, more important work than any that falls to the lot of man. To regulate well a household, to keep in order, cleanliness, and health the home, on the comfort of which the welfare of the whole family depends, is highly skilled work, and at least as essential a function in life as man's external profession or political activities.

The recent demands of certain women for a share in social, political, philanthropic, and educational work are hard to resist, since they are often greatly to the immediate benefit of the community. But it cannot be doubted that the quiet home life necessary for the right birth and management of a large family is incompatible with many external activities, and with the gratification of a desire to seek an apparently larger sphere of immediate work and influence in social, industrial, and political life.

For young married women, such external activities are a direct menace to the future welfare of the race.

Even for unmarried women, the indirect danger is great, especially in setting a false ideal of life before the rising generation. Indications are not wanting that a position of industrial independence, or the wider, if more superficial, interests of active public life, with the demoralizing accompaniment of publicity and notoriety, exert such a fascination on the minds of some women that they become unwilling to accept the necessary and wholesome restrictions and responsibilities of normal marriage and motherhood. Woe to the nation whose best women refuse their natural and most glorious burden !

In considering the physiology and psychology of the race, it seems clear that the stock of human life, our most valuable national asset, must, as in every sound economic system, be divided into two parts representing capital and income. Men represent the income, to be used and spent freely by each succeeding generation as need arises. Women must be considered as capital, to be spent sparingly in the present, to be husbanded carefully for the future.

If such thoughts are suggested by the desire for economic or political activity in women of the upper classes, they are strengthened and confirmed by a study of the effects in the industrial sections of the people.

In towns and other areas where many women are employed in manual labour, such as places where textile industries are carried on, the birth-rate is abnormally low. Northampton, Halifax, Burnley, Blackburn, Derby, Leicester, Bradford, Oldham, Huddersfield, and Bolton—all places in which an

exceptionally large proportion of married women are engaged in factory work—are the ten towns in all England in which the relative fall in the birth-rate between 1881 and 1901 is most startling. On the other hand, in mining districts, where the employment of women is rare, the birth-rate remains high. .

We see, then, that a direct correlation can be traced between the freedom of women from industrial occupations and the number of children they produce. Moreover, other things being equal, the increased maternal care and supervision, secured by the presence of the mother in the home, causes, as one would naturally expect, a decreasing infant mortality. This result was illustrated in a striking manner during the Lancashire cotton famine of 1862. The effect of unemployment, in spite of the fact that the payments made by the relief committees were much below the normal rate of wages, was a distinct fall in the death-rate, especially among infants. The fall was explained by the local registrars as due, partially at any rate, to the presence of the mothers in the homes instead of in the factories.

For the benefit of the children, the absence of the mother from the home is to be deplored. Employment that takes her away should be discouraged by every means in our power. At present, when a respectable, hard-working woman with several children loses her husband by accident or disease, the Poor Law Guardians usually give relief which is quite inadequate for support. The widow is forced to neglect her children in order to earn their bread. For the good of the community, even to prevent economic

waste, we should in this respect adopt the recommendation of the Report of the Minority of the Poor Law Commission and give adequate support, when the conditions of the family and home are good, on the agreement that the mother gives her whole time to her children. The knowledge that such action would be taken in worthy cases would remove one motive which tends to favour restriction of family among the best and most provident of the labouring class. The direct effect of the action would be an ultimate gain to the community, for, as economists have come to realize, "the most valuable of the year's crops, as it is the most costly, is not the wheat harvest or the lambing, but the year's quota of adolescent young men and women enlisted in the productive service of the community ; . . . the due production and best possible care of this particular product is of far greater consequence to the nation than any other of its occupations."

For the welfare of the race, then, it is important to watch jealously the employment of women, and to foster those industries where men of skill and competence are employed at wages sufficient to maintain a family in comfort and respectability.

But care and knowledge are required in framing regulations with the object in view. The good of the child, no less than of the mother, requires a considerable period of absence from work before and after each birth. Yet the economic motive is so strong in the industrial classes that the enforcement of even the short absence now required is probably one of the potent causes of the restriction of the birth-rate,

and any increase in the time would, at present, almost certainly mean still fewer children born.

Such a result would be welcome where the stock is unsound or incompetent, and could some means be devised at the same time of compensating women for their loss of wages in cases where both they and their husbands are worthy citizens, a double economic pressure in the right direction might be established. In past days men founded almshouses and hospitals for the old, the infirm and the weak. May we not hope in the future for endowments for young, healthy, and strong wives and mothers, to be chosen by trustees who should look solely to the probable quality of the offspring? Till we have slowly felt our way through the pitfalls and dangers of State action, some such tentative experiments would be invaluable. Eventually they may lead to a satisfactory system of selective public endowment of parenthood, whereby the State honours and rewards those in all ranks of life who produce strong, healthy, and able offspring, instead of penalizing, as at present, the reproduction of the best elements of the people, and assuming the burdens of those alone who are least likely to give birth to useful members of society.

A sociological experiment is being made in several of our Colonies; without, of course, the slightest knowledge on their part either of the probable effects or the certain dangers of the result. The birth-rate in most of the British Colonies, especially among the capable classes, is as small as or smaller than it is in the mother country. In some colonies legislation has tended to make it difficult or impossible

for households to obtain domestic servants, either from the population at hand or by immigration from older countries. The motive at work among that section of the community which forms the numerical majority and controls the legislation, seems to be the economic fallacy of trying to raise wages by restricting the immigration even of good workers, and a mistaken idea of independence, which regards domestic service as a dishonourable and degrading form of occupation. This state of mind throws a curious light on the attitude towards a home prevalent in such colonies. It is a matter of common experience in older countries, with both those who employ domestic servants and those who undertake the office, that service in a well-regulated household is the best possible preparation for the duties of married life in after years. Indeed, it would be strange if domestic service were the only department of labour where adequate preparation rendered a person less fit to undertake or organize similar work in their turn.

Owing, then, to the impossibility of obtaining suitable assistance in the homes, in such colonies, parents of talent and ability, other than of a manual kind, find themselves in social conditions which compel them to restrict their children to that number for which the wife herself can perform the household duties of cooking and cleaning.

But, from the point of view of the community, a woman of ability is far better employed in giving birth to and educating able children, than in cooking dinners and washing clothes—work which, in the main, is suitable to a different type of mind and body. Hitherto,

in every known successful civilization, the labour of brains in one section of the people has guided and been exchanged for the labour of hands in another section, to the great advantage of both sides.

We have therefore the novel attempt to confuse, or to decline to recognize, the two departments of human activity. In view of the teachings of heredity, it is difficult to see how the attempt can fail to result in a marked restriction in the output of brains on the part of the more talented members of the community. A process of de-civilization apparently must ensue, consequent upon the failure to understand that different conditions are necessary for the development of different types of ability, and the refusal to recognize that both brain power and manual labour are essential to the stability of a State.

When a country adopts a course of social legislation which aims at destroying the domestic amenities hitherto associated with the creation and development of intellectual eminence, it must maintain a strict watch over the effects of its action, or it may find itself ere long with an insufficient supply of those talents which constitute intellectual power and bring in their train material welfare and national greatness.

The idea that a community should be self-contained and self-supporting is one of which we have heard much in recent years. The truth of this proposition is, to say the least, extremely doubtful ; interchange and interdependence bring many benefits to all concerned. But the desire for economic independence has clearly to be reckoned with, not least in those communities whose legislative peculiarities we are now considering.

But those who feel this desire should not forget that man does not live by bread alone ; that religion, philosophy, art, literature, science—in short, all things and more that are implied in that fine old term “the humanities”—are what really distinguish man from the lower animals, and make the difference between civilization and barbarism.

It is of little use for a community that seeks to be self-supporting to supply itself with bread and boots, if it has to take its philosophy of life from the outside world, and deliberately to forego the glories of a national art and literature. It is thus more truly parasitic on other States than any imports of corn or wine or oil can make it.

Again, Canada, unlike some of the other British Dominions, is a country which seeks to attract colonists to fill up its vacant spaces. The newly settled districts have a very low birth-rate, and the difficulty of obtaining domestic servants is great ; though in this case it is not to be ascribed to legislative interference against any form of so-called “white labour.” But apparently the Canadian farmer can absorb an unlimited quantity of the slum population of Great Britain, when once that population has got through those years of infancy and childhood that require constant parental care. There is a great demand for partially trained boys and girls, old enough to help in the households and homesteads and young enough to adapt themselves easily to the new surroundings of life and labour. We can only suppose that the difficulties connected with the rearing of children in the present circumstances are so great that other people’s children, already reared and trained,

even if of a lower type and probably derived from thriftless and casual stock, are to be preferred to the children of the colonists themselves—children who will require the accustomed nurture and upbringing for ten or twelve years, before they can be of economic value. This is surely a very unnatural and dangerous state of affairs. There is evidence to show that the objections to this form of colonization are beginning to attract the attention of Canadian statesmen.

To some people the failure of the United States to produce a proportionate number of great men is a disquieting feature of their civilization. Two hundred years have elapsed since the settlement began to take a permanent shape. The population is now immense, the opportunities for education and development are unprecedented. Yet the native-born men of real eminence, of world-wide fame, are very few in number. It is possible that here we have the consequences of conditions of life somewhat similar to those our Colonies are tending to establish.

CHAPTER XI

CONCLUSION

WE have now arrived at the end of our survey of the influence of heredity on the character of the family, and through it on the nation. Let us endeavour to summarize the results of our inquiry and to take stock of our present position.

Modern biological and statistical investigations have emphasized the importance of heredity in determining individual character, ability, and constitution. All men, and not poets only, are born, not made. The influence of environment—home surroundings, education, the accidents of life—do but modify the innate qualities handed down to a man from his ancestors.

It is impossible to predict the particular combination of ancestral factors which will chance to fall into conjunction to fashion any one individual. But the average quality of a fairly large family may be foreseen more or less clearly from a knowledge of the parents and their ancestry, both lineal and collateral, while, in dealing with numbers, as in the nation in general, the statistical results are exact and predetermined.

From the national point of view, then, it becomes

of paramount importance to inquire what classes of the community are reproducing themselves fastest. Natural selection eliminates the unfit, and thus secures that the parents most suited to the existing environment, on the whole, shall rear most offspring. But we find that civilization of the modern European type introduces an artificial selection, whereby the best stocks restrict voluntarily the number of their offspring ; while, owing to improved conditions of life and direct subsidies from the community, the least successful sections of the population are able to escape the severity of nature and to multiply rapidly.

Arithmetical calculation shows that, if one section of a people reproduce itself faster, even to a slight degree, than the rest, it will rapidly surpass all other sections in numbers, and, after a few generations, dominate the whole of the nation.

A study of the birth-rate of different classes of the British people brings out the fact that the average number of children, in the family that produces children at all, has now, in the great mass of the more successful part of the nation, fallen below one-half its value forty or fifty years ago. The titled and untitled landed aristocracy, the more eminent of the official, professional, and commercial classes, show the same result, while it extends equally to the thrifty and provident skilled artisans. The only sections of these classes which maintain their birth-rate at its old high level are the clergy, the Roman Catholics, and the Jews. Two hundred thousand births fewer each year than should be expected now take place in the British Isles—one-fifth of the annual total. And this fifth that is wanting

is the most valuable fifth of the whole, the younger children of large families in the best stocks of the nation. Galton calculates the proportion of eminent men as about one in four thousand of the population in general. We shall not be over-estimating if we suppose, that at least one in two thousand of this selected fifth would possess eminent ability. Hence, every year, among the two hundred thousand, the country is losing one hundred babies, who, if they had existed and lived to grow up, would have become eminent. Who can calculate the injury to the nation inflicted by the suppression of this lost legion?

On the other hand, there is little or no fall as yet in the ranks of the casual labourers and of the feeble-minded men and women still at large amongst us. Thus the stocks which are least successful or definitely unsound are increasing fastest.

At present this phenomenon has affected only one generation, of whom the oldest are now in early manhood. But even so, its effects are beginning to be felt. The supply of competent candidates for entry into certain professions is already falling, while it becomes more and more difficult to find men of sufficient character, ability, and good manners to fill the higher administrative posts as those posts increase in number.

But the amelioration in the average life of mankind, the increased wealth of the nation, the paraphernalia of the Poor Law and the universality of elementary education, have completely failed to abolish the prevalence of pauperism, which, in late years, with lunacy and feeble-mindedness, even tends to increase. Thus, in spite of all our efforts, the number of those who are

parasitic on the rest of the community shows signs of growth. An increasing share of each competent man's labour goes to support—even to create—those who cannot support themselves.

It is impossible to resist the conclusion that, as the dearth of competent men to fill the higher professional posts is the result of the restricted birth-rate of the better sections of the people, so the threatened growth of lunacy and pauperism is the result of unchecked reproduction and diminished mortality among unsound and incompetent families.

In considering the causes which have impelled the successful classes to wish to restrict the number of their offspring, we were impressed at once by the complication of the problem. A mistaken sense of individual responsibility, which tends to prevent the birth of children for whom lavish pecuniary provision cannot be made by their parents, seems to be the worthiest of the motives at work. The economic factor in all its aspects is probably the most widespread of the causes. The expense of rearing, educating, and starting children in life is heavy in all classes, save among the very wealthy, and in that section of the very poor who are ready to allow the community to support their offspring. Unwillingness to face the discomfort and discipline of life which a large family entails on the parents, and especially on the mother, is a potent factor among those people who take advantage of modern facilities for a restless life, unceasing social activity, and an excessive devotion to sport and games. The extension of the activities of women in spheres social, political, and economic, has probably much to

answer for. The failure to pay due honour and respect to the natural duties of women—more important in their way than those of men—has been one reason why some women have desired to assume responsibilities for which they are less fitted. In industrial life, the welfare of the children has been shown to be incompatible with the general employment of married women in factories and workshops.

The long immunity of England from wars in which her national existence has been at stake has tended to reduce the healthy sense of the duty of personal service to the community, and to obliterate the feeling of social responsibility. Countries in which universal military training has been enforced seem to have suffered less from this weakening of the moral fibre. Universal military training is doubtless good for the moral and physical welfare no less than for the security of a nation. But some of those who advocate such training for other people's sons might do more to provide sons of their own to share its benefits.

One generation of the successful classes has been halved in number, while the unsuccessful have continued to increase. The relative burden of incompetence carried by the nation is heavier, and, judged by the returns of pauperism and insanity, tends to increase yet more. Incalculable harm has been done to the race. For years the returns of the Registrar-General have contained results which ought to have warned the nation. Yet our politicians, even our statesmen, occupied with questions of party interest, have failed to proclaim, perhaps to notice, the significance of the position.

Nevertheless, the reserve of health, strength, and ability in the British people is very great. Could they be awakened to their danger, there is yet room for repentance, recovery, and perhaps for advance to levels higher than any hitherto reached.

Certain possibilities of action seem open to us when we realize the importance of the issues at stake. By legislative reform we may segregate the worst types of the feeble-minded, the habitual criminal, and the hopeless pauper, and thus weed out of our race the contaminating strains of worthless blood. Beyond that point in this direction it would be unsafe to go, till we understand much more fully the principles of the science of inheritance.

As far as legislation is concerned, two problems are ready to be attacked : those of the feeble-minded and of the "able-bodied" pauper. On these subjects two independent Royal Commissions have reported, and we are but waiting till political exigencies allow the Government to propose legislation. Let us hope that questions of such fundamental importance may, by mutual consent, be treated as unfit ground for party strife.

The Commission on the Care and Control of the Feeble-Minded recommend that the powers of the present Lunacy Commission should be enlarged and strengthened, so as to enable them to deal with all types of mental defect. At present the control over those unhappy children who are feeble-minded ceases at sixteen years of age—exactly when it is beginning most to be needed. If the recommendations of the

Commission be carried out, those who are clearly unfit to manage themselves, and have no responsible guardians, would be placed permanently in homes or farm colonies. Experience shows that only under proper care can the mentally defective live reasonably happy, useful lives, and only thus can they be prevented from falling into vice and reproducing a constantly increasing number of children similarly afflicted. The annual additional cost of the scheme is carefully estimated at half a million pounds, which would be saved many times over in relief of charges for workhouses, prisons, and lunatic asylums, while the indirect economic gain to the community in increased average efficiency cannot be calculated.

The Commission on the Poor Laws and Relief of Distress have presented two separate reports embodying alternative schemes. But on some points the Commissioners are unanimous. Both reports condemn the present mixed workhouse and the present system of treatment, whereby hardship is inflicted on the deserving and unfortunate poor ; while the habitually idle and dissolute vagabond finds every convenience for entering and leaving the workhouse at will, and for continuing indefinitely his or her useless and harmful mode of life. Periods of support at public expense alternate with periods of freedom and licence, and the reproduction of a degraded and degrading type of humanity goes on unchecked. Hence both reports advise the formation and development of labour exchanges to bring employers and workmen into communication, and to provide a test of a man's willingness to work—the “beneficial and natural test” of the

offer of a situation. If such an offer be refused, both majority and minority recommend that the offender should be sent to a detention colony, where, under proper supervision, he should be given the opportunity of recovering his right to freedom, or, in hopeless cases, be deprived permanently of the power of further injuring society and degrading the future quality of the human race.

Here, then, we have two proposals, supported by the unanimous authority of two separate Royal Commissions. About these proposals there should be no difference of opinion among all right-thinking men. Consideration has been long and deliberate ; the time has come for action. The next Session of Parliament should see the closing of the flood-gates through which has poured this devastating torrent of degraded humanity.

Much of the petty crime of the country may be laid to the door of the feeble-minded, and will cease when they are brought under control and gradually diminished in number. But besides these cases, there exist families of incurably vicious tendencies, producing a definite low type of habitual criminal. In dealing with men and women of this character, where we cannot hope to accomplish individual and radical cure, we must, as with the feeble-minded, organize extinction of the tribe. In old days, the law attempted this extinction by hanging, a preventative of the sternest and most efficient nature. In so-called barbaric countries, where even nowadays self-protection of the community proceeds on still more drastic lines, not infrequently the immediate family of the offender perishes with him. The purification of the State is the first concern

of its governors. For us, with our different ethical standards, the old methods are impossible. We must attain the same result by the longer, gentler system of perpetual segregation in detention colonies, with all the mitigations that are practicable.

If any doubt should arise how far it is justifiable thus to safeguard the future of the race, let us remember that the higher standards of the better classes in matters of hygiene, education, etc. have already been enforced sternly on all, where the good of the community is involved. If compulsion of this sort be right in small things, immeasurably more so is it in great. The inborn physical, mental, and moral welfare of the people is better worth securing than a superficial cleanliness. The old saying that prevention is better than cure takes a new and vivid meaning in the light of our knowledge of heredity.

So far we are ready to go, in preventing by legislation the growth of undesirable elements in the community. To favour the increase of good stocks is a more difficult problem.

At present the possibilities of legislative action are small, and seem to be confined to an attempt to lighten some of the burdens that fall specially on fathers of families. In this present year, 1909, the Treasury has made a beginning, and discriminated in the incidence of income tax on small incomes in favour of parents. This action might safely go much farther, and some such scheme as that suggested in the last chapter might exempt from income tax all money spent in maintaining and educating a family—a proceeding which, at the

same time, would throw some of the additional financial burden on those who escaped this form of national service. Pious founders might establish endowments for satisfactory parents, and, with the experience thus gained as a guide, the State might slowly feel its way to granting honours and rewards, suitable to all ranks of life, to those who produced and brought up strong, healthy, and able offspring.

Of late years, the duty of the State to support the falling and fallen has been so much emphasized that its still more important duty to the able and competent has been obscured. Yet it is they who are the real national asset of worth, and it is essential to secure that their action should not be hampered, and their value sterilized, by the jealousy and obstruction of the social failures, and of others whom pity for the failures has blinded. Mankind has been shrewdly divided into those who do things and those who must get out of the way while things are being done, and if the latter class do not recognize their true function in life, they themselves will suffer the most. The incompetent have to be supported partially or wholly by the competent, and, even for their own good, it would be worth while for the incompetent to encourage the freedom of action and the preponderant reproduction of the abler and more successful stocks. It is only where such stocks abound that the nation is able to support and carry along the heavy load of incompetence kept alive by modern civilization.

Meanwhile and always, our duty is to investigate the problems of heredity, and to apply new-won conceptions

to questions of sociology. As from time to time definite conclusions are reached, we shall be ready to formulate our social policy in the light of reasoned beliefs and scientific knowledge of the existing conditions and tendencies of the life of the nation. "The proper study of mankind is man," and in that study the scientific and humanist schools find common ground.

The examination of all influences tending to favour the growth of the more suitable races and better strains of blood, has been called by Sir Francis Galton the science of Eugenics. Alone of our universities, the University of London possesses definite provision for the systematic investigation of the subject. In the Galton Eugenics Laboratory at University College, Professor Karl Pearson and his assistants have made a beginning of the study of mankind from this point of view.

It is much to be deplored that in neither Oxford nor Cambridge, where a great part of our governing classes are educated, is systematic provision made either for advancing the knowledge of inheritance as regards its bearing on sociology, or teaching the conclusions already reached to those who in the future will have the direction of national affairs. Cambridge has, it is true, a professorship of Biology, which Professor Bateson holds to the great advantage of genetic science. The scientific study of heredity is provided for. Moreover, in the practical application of Mendelian principles to agricultural science, the work of Professors Biffen and Wood at the Cambridge University Experimental Farm has marked the opening of a new epoch in agriculture.

But no means exist for the advancement and teaching of genetics from the point of view of the economist, the sociologist, and the statesman. Few opportunities open to the public-spirited man or woman of wealth would yield a better return in benefit to the community than the foundation of a school, in the older universities to extend the new knowledge of heredity to the problems of the nation and mankind.

Much material for investigation is supplied by the Census returns and the Annual Reports of the Registrar-General. Here we have the basis for a national socio-logical department, which, in the future, should possess a preponderant weight in the legislative counsels of the Government.

Public opinion must be educated not only by academic study in the universities and elsewhere, but by more popular methods. To develop a healthy tone of mind about the future of the race is worthy of all our efforts.

It is necessary first to convince that small section of the community that really judges and decides questions according to the light of reason, and then to create such ingrained feelings and associations in ourselves and others with regard to the subject, that instinctively all men will come to decide questions rightly, as now too often they decide wrongly. We are beginning to understand better the psychology of a nation, and to know that a few simple ideas are all that it is possible to impress at once on the minds of the people.

If we had to state the essence of our subject in a brief form, we should say : Encourage in all ways

early marriages and large families for men and women of health, strength, and ability ; discourage both marriage and offspring where either parental stock is unsound in body or mind. This is emphatically an attitude which should guide private individuals in their charitable efforts. The State must provide somehow for all persons, whether worthy or unworthy. But private assistance and personal interest may well be bestowed chiefly on those honourable citizens, who, having given evidence of good character and ability, require temporary help to tide them over some period of ill-health or adversity.

More can be done by quiet influence and example than is realized. Much of the present mistaken action is due to the tone of public opinion. It is no misstatement to say that it has become "fashionable" to have a small family, or none at all. But already signs are not wanting that we are near a change for the better. The tide appears to have turned in the United States, where it seems that flourishing families of three, four, or five are beginning to replace the ones and twos of the last decades. We believe that a similar change may be brought about in England, and that very soon excessively small families will be regarded as an out-of-date fashion of a few years ago. Such a psychological attitude, though apparently due to a not very exalted motive, would of itself do much to right the evil. The feeling to be produced in a certain class of mind may be illustrated by the playful suggestion that social precedence should be determined, other things being equal, by the number of healthy children. If honest Mrs. Quiverful, the curate's wife, were led

into dinner by Lord Oldcastle before Mrs. Gadsby of Slocum Manor, it would be safe to predict that, in a few years, less of the income of her husband, himself the only son of his father (Gadsby of the Stock Exchange and later of Slocum), would find its way to Newmarket or Monte Carlo, and more to Eton or Harrow.

But, seriously, our increasing knowledge of psychology makes it clear that, to move the mass of mankind, academic argument and appeals to reason will of themselves produce little effect. They are needed to start a movement ; but to make it a living force in the world, those who are convinced intellectually must get themselves and others into the right psychological attitude by continued suggestion and association of ideas. Fashion has a real and essential psychological meaning. Owing to the nature of mankind, action is controlled far more by habits of mind than by slow and deliberate reason. "All we like sheep have gone astray," and like sheep, with a dog to bark and a bell-wether to lead, we must be brought back into the right path. We must learn instinctively to pay honour to those who, sound in mind and body, bring up well a large family, and not less to those who avoid marriage or have no children in fear of perpetuating their own infirmities. On the other hand, they who neglect their duty to the nation and the race in either respect must be made to feel the unfavourable verdict of society. A man who will not earn his living or learn to defend his country, a woman who neglects her household and refuses to perform her maternal duties, and a nation which will take no

thought for the morrow, must all be classed among the failures of civilization.

Whether or no the importance of the issues at stake comes to be recognized fully by the nation at large, individuals and families have it in their power to act on the knowledge they have acquired. In old days, more attention was paid to family history than has been usual during the last hundred years. From the beginning of the sixteenth till the end of the seventeenth century, periodic visitations to the different counties in England were made by the Heralds, and the arms and pedigrees of gentle families were recorded systematically. It is true that for scientific purposes the pedigrees were very deficient, and consisted chiefly of lists of names and places. But the principle was sound, for it recognized the family and not the individual as the true social unit, and it needed but little development to have given a complete genealogical and sociological register of the upper ranks of the population, thus supplying information of incalculable theoretical and practical value.

It was then a matter of pride among the upper classes to marry only into families entitled to bear arms. With the English fashion of quartering only the arms of heiresses in the shields of their descendants, it was not possible to represent on a coat the ancestry with any completeness. The foreign plan of quartering all the arms of lineal ancestors gave a more systematic and scientific method. The possession of the coveted *seize quartiers* then in fact proved descent from sixteen strains of blood, all of families of known and recorded

position. When once more the importance of good birth comes to be recognised in a new sense, when the innate physical and mental qualities of different families are recorded in a central sociological department or scientifically reformed College of Arms, the pedigrees of all will be known to be of supreme interest. It will be understood to be more important to marry into a family with a good hereditary record of physical, mental, and moral qualities than it ever has been considered to be allied to one with sixteen quarterings.

In many directions during the nineteenth century in England the prevailing habit of mind thought little of old traditions, the true meaning of which our imperfect knowledge did not then suffice to explain. Often the tradition embalmed the accumulated experience of the ages, and involved truer wisdom than could be deduced by *a priori* reasoning from faulty or insufficient premises. This shallow intellectualism is characteristic of the period in all realms of thought. It overshadowed for a time, or in some cases perhaps destroyed for ever, survivals of scientific and practical value in politics, sociology, philosophy, and religion. In no department of knowledge was the self-satisfied individualism of 1850 more positive or more at fault than in matters of genealogy and heredity. The aristocratic theory of the family, which even those who believed in and acted on hardly then ventured to support openly, contains the root of the matter, and only wants restating in modern terms to take its place as a great scientific truth. Families in which good and noble qualities of mind and body have become hereditary form a natural aristocracy, and, if such families take pride

in recording their pedigrees, marry among themselves, and establish a predominant fertility, they can assure success and position to the majority of their descendants in any political future. They can become the guardians and trustees of a sound inborn heritage, which, incorruptible and undefiled, they can preserve in purity and vigour throughout whatever period of ignorance and decay may be in store for the nation at large. Neglect to hand on undimmed the priceless germinal qualities which such families possess, can be regarded only as the betrayal of a sacred trust, given them for the good of the nation and mankind.

We look then for a day in the near future, when, in some circles at any rate, a comparison of scientific pedigrees will replace, or at all events precede, the discussion of settlements in the preliminaries to a marriage ; when birth and good-breeding (in its wide sense), character and ability will be the qualities most prized in the choice of mates ; when a bad ancestral strain likely to reappear in succeeding generations will suppress an incipient passion as effectually as it is now cured by a deficiency of education or a superfluity of accent.

Moreover, since the assumption of the responsibility of offspring falls on those of the younger generation, whose financial position, even in the upper classes, is usually not yet secure, it should become an increasing habit for the older generation, where they have it, to distribute a substantial part of their property during their lifetime. Such a distribution should not excite the animosity of the Chancellor of the Exchequer. Security or affluence often comes too late to make easy the heavy burdens of early maturity, and, when

it comes, provides but bitter reflection over lost opportunities. Those in the prime of life can make the best use of wealth in the service of the nation ; may each generation, as they grow older, learn to relinquish it in time to watch their successors meet fully their responsibilities.

Not only should public opinion favour the free production of the best elements of the population, and the restriction of the worst, in the upper and middle classes, but similar principles should guide the conduct of all who have to deal with workpeople or servants. For instance, the present habit of advertising for coachmen, gardeners, and gamekeepers "without encumbrances" should meet with the universal reprobation it deserves. Such announcements ought not to be allowed to disfigure the columns of otherwise respectable newspapers. These men, usually of good stock, with regular, well-paid work, should be a steady source of valuable addition to the population, and pride should be taken in providing for their occupation cottages with accommodation suitable for a large family. In fact, those responsible for the management of estates might make sure, as a general policy, that the limited number and inadequate size of cottages cannot be made the excuse by satisfactory parents for the limited production of children. Country landowners have many and great responsibilities, which for the most part they have met well. When they come to realize the importance to the nation at large, and even to their own neighbourhood, of a constant supply of healthy children of good stock, they will find there are

many ways besides example in which they can exert an influence for good.

Of late years the Christian Church has organized much of its social work on a revived sense of the old conception of the brotherhood of man. We must now look to it to lead a movement in another direction, even more deeply fraught with spiritual meaning, where parenthood and responsibility to those who will follow after us will be the uniting principles of new religious life.

It is not enough to preach with horror and indignation against normal parents who restrict their families. Equal reprobation should be the lot of those who, with inherited insanity, feeble-mindedness, or disease, bring children into the world to perpetuate their infirmities.

It should not be overlooked that the realization of the power of limiting the birth-rate, while it has produced untold harm, when applied blindly and in accordance with individual caprice, may become an instrument for good if it extends to the worst stocks of our people, while the better stocks once more undertake their natural duties. Those who, sound in body and mind, possess a high moral tone and a clear appreciation of their social responsibilities, who realize the sanctity of the gifts of inheritance of which they are at once the owners and the temporary trustees, will produce many offspring. Those with lower ideals will continue to restrict their families, and, with the weaker and unsound stocks, will weed themselves out of the race. Thus once again a selection—this time a conscious selection—may be established to favour the

growth of all noble qualities ; thus the nation may start anew on its road to improvement.

Our new scientific knowledge of heredity does but emphasize the age-long warning of the Church, that marriage and the procreation of children are not to be “taken in hand unadvisedly, lightly, or wantonly, but reverently, discreetly, advisedly, soberly, in the fear of God,” and knowledge of His laws. But, while warning from parenthood those not fit for its responsibilities, let us give a new and deeper meaning to the old Bidding Prayer, and ask with all our hearts “that there may never be wanting a supply of persons duly qualified to serve God in Church and State.”

In the course of these pages, we have had to draw a gloomy picture of the tendencies which have shown themselves in the nation during the last forty years. But we must not be understood to think badly of the future. Twice at least in her history, England has recovered from the effects of a period of wrongly-directed selective birth-rate. The recognition of the causes at work is but the first step towards better things. We believe in the moral soundness of the nation, and feel convinced that, with their eyes open, the best elements of the people will not persevere in their present course of race deterioration. There is plenty of good stock in England, and an appreciation of its value and of its necessity to the nation will force us to find ways of encouraging its reproduction and checking that of the evil strains.

Then our race once more will improve. What are the limits to that improvement none can say. Though

some evidence points to the idea that change in a strictly homogeneous people could not be continued indefinitely, that they would tend to return to the mean or average type, the divergences of origin, the differences of strength, character, and ability, are so marked among us, that it is clear that our nation is not homogeneous, that there are many types in our race. It is certain that we can favour the growth of our best existing types, and thus raise almost indefinitely the average value of the whole nation, even if we cannot with confidence look to the development of types higher than any yet known.

But, on any view, the average strength, character, and ability of the nation can be raised to such a degree that many things now impossible will become easy for all. Galton estimates that the ability of the ancient Greeks was two of his degrees higher than that of modern Englishmen. Could we only regain a level already reached by one race of men, how much the lot of all would be lightened! Every man could produce more with the same expenditure of energy, or produce the same amount and gain new leisure and ease. The health, comfort, and happiness of our nation would increase enormously, and the character and ability would be there, ready and capable of using well the new possessions of leisure and ease. Leisure and ease, useless or harmful to those who cannot fill them worthily, are a priceless gift to whosoever can employ them to advance civilization or can appreciate the treasures of literature, science, and art.

The certainty that the present selective fall in the

birth-rate is wholly, or in greatest part, voluntary is full of hope. Had it been due to a lessened natural fertility of the better elements of the nation, it would have been of overwhelming sinister import to the future of the human race. That is not so. All our evidence goes to show that able and eminent men and women are full of vitality and are naturally fertile. Artificial modes of life—hurry, restlessness, luxury, overfeeding—may have diminished temporarily the power of bearing and rearing children among some women. But such influences are small compared with those under our direct and immediate control, and can be destroyed by a determined and sustained effort.

We have destroyed natural selection of the old sort, “red in tooth and claw.” The race is ceasing to improve, is beginning to deteriorate. But almost simultaneously, while there is yet time, by the blessing of Providence, our eyes have been opened, and we are become like gods, knowing good and evil. The future of our race is placed in our hands to mould as we will.

We cannot escape our responsibility, even if we would. Occasionally one is met by the idea that all control of agencies for the conscious bettering of the race is immoral and irreligious. As well let us accept the degraded but essentially identical view that the attempt to understand and control pestilence and famine is contrary to the will of God! Such arguments have been used in old time, are still used in the more superstitious and backward nations of the world. We have outgrown them. In all things we have come to know that God helps those who help themselves.

Again, it is sometimes thought that general recog-

nition of the influence of heredity and natural selection may check the beneficent efforts of mankind for the improvement of the material and intellectual environment of the race. But it is to able, competent men that we look for each successive step in the science and art of practical life, and for the steady application of new principles to the everyday surroundings of the people. On the other hand, retrogression would be inevitable if, through a failure to appreciate the position, the stock of inborn ability ran down, and the nation became on the average incompetent. At present, it is only possible to attempt to prevent deterioration, and it is difficult enough to find an effective conscious selection to replace nature's rougher ways. But, however the standard of man may be advanced in the future, there will remain sufficient comparative evil to satisfy the pugnacity of the most ardent champion of good. The improvement of the environment is always worthy of effort, not only for its immediate effect, but also for its influence on coming generations. Acquired characters may not be transmitted by animals or plants, but, in the social organism, a character impressed by the action of one generation will, without doubt, modify profoundly the qualities of the next. Improvement of the environment will always be the more popular cause; it produces more immediate results, and results that may affect individually those who are asked to expend money or personal effort, or to submit themselves to the necessary limitations. But, ultimately and essentially, the inborn character of a race is the higher consideration. If we seek that first, all the

blessings of a good environment will be added unto us.

Hitherto the development of our race has been unconscious, and we have been allowed no responsibility for its right course. Now, in the fulness of time, and for some good reason, we are treated as children no more, and the conscious fashioning of the human race is given into our hands. Let us put away childish things, stand up with open eyes, and face our responsibilities.

How shallow now sounds the argument that a knowledge of the power of heredity will loosen the sense of moral responsibility ! It may strengthen the case of the philosophic determinist, but in practice the revelation of the effect of our present conduct on the physical, moral, and spiritual welfare of millions yet unborn, must give a new motive which, on any philosophic theory, ought to and will tend towards righteousness.

Whatever be the meaning of the great mystery of life, whatever part in the scheme of creation be filled by the human race, the quality of that life is of supreme importance. The Universe cannot be meaningless ; it must have a spiritual significance. A spiritual evolution must be accompanying the natural evolution, and in that spiritual evolution some useful part we do not understand is played by the growing total of human life, which brings into being new spiritual manifestations. To doubt the high destiny and the spiritual significance of the human race is to doubt the intelligibility of the Universe, the goodness of God.

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